

# HP mPrinter 4000 Fixed Imager Maintenance and Service Guide



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# Revision History

**Table 1-1** Revision History

Date	Edition	Revision	(DA / Owner)
February 2007	A	Initial release of document per [75493W-ECO]	(EB / GL)

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# 1 Introduction

This document provides HP recommended maintenance and service procedures for the Q2337A, HP mPrinter 4000 Fixed Imager. It will enable an OEM integrator to develop maintenance and service procedures. Information included:

- Chapter 2, **Safety**, covers cautions and hazards including personal safety and waste management.
- Chapter 3, **Precautions**, covers periodic maintenance procedures and recommended frequency.
- Chapter 4, **Troubleshooting/Service & Repair**, covers recommended service and repair procedures, as well as troubleshooting flowcharts.
- Chapter 5, **Repair Validation**, covers procedures to validate repairs performed on the imager and its components.
- Chapter 6, **Replacement Parts**, covers details on replacement parts used in the HP mPrinter 4000, as well as detailed procedures for installing those parts.

Several appendices are also included, covering topics such as return procedures, locating part or serial numbers on replacement parts, fastener torque values, and error codes.



**NOTE:** This document is confidential and must be used in accordance with the Confidential Disclosure Agreement (CDA) that is in place with HP.

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## Basic Assumptions

This manual is written primarily for field technicians with the assumption that every technician is trained and therefore familiar with the HP mPrinter 4000 and authorized by the OEM to perform the service. The manual makes no attempt to explain how to remove any of the HP mPrinter 4000 modules from the OEM's platform; this remains the responsibility of the OEM. Disassembly instructions begin with the module already removed from the OEM's platform.

HP does not provide any small miscellaneous parts such as screws, washers, cable ties, or other small, commercially available off-the-shelf items; the OEM is responsible to provide these items to their service personnel. Service personnel must also be capable of repackaging replacement parts required to be returned to HP for failure analysis, including boxing and securing of the parts that require return to HP in the HP-approved box.


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## About This Document

If you are reading an electronic version of this document, there are internal links that will take you to referenced topics. For example, clicking on an item listed in the table of contents will take you to that page.



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**NOTE:** Illustrations with a number in a circle are cross-referenced to the corresponding step in the procedure. For example,  illustrates step 3 of the related procedure.

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## Document Formatting Conventions

Command	<b>ImagerMaintenance</b> command
State	<b>intervention</b> state
Interrupt	<i>paper jam</i>
Mode	<i>Access Mode</i>
Instruction	ENTER or EXIT instructions
ASCII strings, or user input	<code>CAPITAL LETTERS (courier)</code>

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## Related Documents

Integration Guide (802896ce)  
Firmware and Software Integration Guide (80074a73)  
Service Videos (Q2337-90013)  
Product Brochure (802896cd)

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## Software

Imager Test Center for Windows  
Imager Controller Programmed HD, Firmware Code

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## Hardware

This Manual covers the following product models which together make up the HP mPrinter 4000:

- Controllers: Q7473A and Q7473L

- Ink Delivery System: Q2326A and Q2326L
- Imaging Module (Imaging Head): Q2337A and Q2337L
- External Cable Set: Q7474A and CB882L

These modules are interchangeable; the main difference is that the “L” modules are compliant with the European Restriction of Hazardous Substances Directive. The EU RoHS directive restricts the presence of certain substances in electric and electrical products and their component parts offered for sale in the European Union after July 1, 2006. The purpose of RoHS is to contribute to the protection of human health and the environment. See product brochure for a complete list of environmental compliance approvals.

Only the controllers have minor internal differences in the mounting of the hard drives and in the main power cable to the 24V power supply, but all other replacement parts are interchangeable.

## Consumables

- Black 4240 Pigment Printhead HP Part Number: Q2389L
- HP Black 4240 Pigment 775 ml Ink Cartridge HP Part Number: Q2326-60011
- Printhead Cleaner HP Part Number Q2326-60011
- Setup Pens HP Part Number C8863L

See product brochure for a current, complete list of approved supplies.

## Replacement Parts

The Replacement Parts list is below, representing the parts authorized for replacement under warranty by certified service technicians. No lower level parts may be change due to the manufacturing procedures and/or tools required for proper installation and validation. Disassembly of modules or assemblies to an unauthorized level by any service technician will immediately void the warranty.

## Product Models and Replacement Parts Table

**Table 1-1** Product Models and Replacement Parts Tables

Imager Controller	Part Number	Used in non-ROHS/ROHS Parts
PCA, Engine, FFI	Q2327-67001	Q7473A & Q7473L
PCA, Interconnect, FFI	Q2327-67002	Q7473A & Q7473L
PCA, Formatter, Jesulin	Q2327-67006	Q7473A & Q7473L
Celeron CPU	Q2326-67008	Q7473A & Q7473L
Fan Assembly 15VDC 31cfm	Q2337-67022	Q7473A & Q7473L
Memory, RAM, cmos, 256MB	Q2326-67009	Q7473A & Q7473L

**Table 1-1** Product Models and Replacement Parts Tables

<b>Imager Controller</b>	<b>Part Number</b>	<b>Used in non-ROHS/ROHS Parts</b>
FanFilter_2494 (Bag of 10)	Q2337-67001	Q7473A & Q7473L
Fan_CR0824UB_A71GL	Q2337-67002	Q7473A & Q7473L
Hard Disk Drive (40 Gb, IDE2)	Q2326-67010	Q7473A & Q7473L
ATX Power Supply Unit	Q2326-67012	Q7473A & Q7473L
Aux PSU AC-DC, 24V ROHS	Q2326-67013	Q7473A & Q7473L
Giga Bit Card (PWLA8391MTG1P20)	Q2337-67014	Q7473A & Q7473L
Cable, Power / Reset	Q2337-67003	Q7473A & Q7473L
Cable, INC to Rear Panel	Q2337-67004	Q7473A & Q7473L
Cable, Engine/ MB Control	Q2337-67007	Q7473A & Q7473L
Cable, DC Output to INTC	Q2337-67009	Q7473A & Q7473L
Cable, Engine to INTC	Q2337-67010	Q7473A & Q7473L
Cable, Fan to Power Supply	Q2337-67017	Q7473A & Q7473L
<b>Imaging Module</b>	<b>Part Number</b>	<b>Used in non-ROHS/ROHS Parts</b>
PCA, Carriage, FFI	Q2327-67003	Q2337A & Q2337L
Assy, PH Interconnect, FFI (set of 5)	Q2326-67001	Q2337A & Q2337L
Assy, Service Station [5x1]	Q2337-67011	Q2337A & Q2337L
PCA, Servo, FFI	Q2327-67004	Q2337A & Q2337L
PCA, Printhead Connect	Q2337-67019	Q2337A & Q2337L
<b>Ink Delivery System</b>	<b>Part Number</b>	<b>Used in non-ROHS/ROHS Parts</b>
PCA, IDS, FFI	Q2327-67005	Q2326A & Q2326L
PCA, need tube to be added to PCA		Q2326A & Q2326L
Assy, Ink Feed, Array [5x1]	Q2337-67020	Q2326A & Q2326L
Pressure Control Module	Q2326-67016	Q2326A & Q2326L
Assy, Stall, Large, Single	Q2326-67015	Q2326A & Q2326L
Cable RS-232		Q2326A & Q2326L



<b>Ink Delivery System</b>	<b>Part Number</b>	<b>Used in non-ROHS/ROHS Parts</b>
Cable stall connect		Q2326A & Q2326L
Assy, Tube Ink Flow	Q2326-67017	Q2337A & Q2337L
<b>External Cable Set</b>	<b>Part Number</b>	<b>Used in non-ROHS/ROHS Parts</b>
Assy, Cable Harness, IH Power	Q2326-67002	Q7473A & Q7473L
Assy, Cable Harness, IH Data	Q2326-67003	Q7473A & Q7473L
Assy, Cable Harness, Encoder	Q2326-67004	Q7473A & Q7473L
Assy, Cable Harness, Top of Form	Q2326-67005	Q7473A & Q7473L
Assy, Cable Harness, IDS	Q2326-67007	Q7473A & Q7473L
Assy, Cable Service Station	Q2326-67018	Q7473A & Q7473L
Cable Kit, 3m	Q7474A	Q7473A

## Service/Maintenance Disposables Not Provided

- **Large Rectangular Head Swab:** This is general purpose closed cell polyurethane foam with a rigid paddle used to clean the dimple contacts in the latch assembly. An example is ITW Texwipe® part number TX707A
- **Wipe Cloth:** This is a tight weave cotton free of free floating fibers on the fabric surface. An example is the ITW Texwipe® part number TX309

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## 2 Safety

### Hazards

The safety hazards associated with the HP mPrinter 4000 Fixed Imager are described in the Hazard Matrix table below. Gray-shaded rows indicate hazards that are not present.

**Table 2-1** Hazard Matrix

Potential Hazard	Present	Summary
Chemical	Yes	<p><b>Hazard: Ink</b></p> <ul style="list-style-type: none"> <li>Prolonged inhalation of ink aerosol or vapors may cause irritation to the respiratory tract.</li> <li>Ink may be a potential skin and eye irritant.</li> </ul> <p><b>Injury Prevention:</b></p> <ul style="list-style-type: none"> <li>Avoid prolonged or repeated exposure, inhalation, and contact with skin and eyes.</li> <li>Wear lab coat, safety glasses, and latex gloves.</li> <li>Avoid direct contact with chemicals.</li> </ul> <p><b>NOTE:</b> See appropriate MSDS for more detailed health hazard data.</p> <p><b>Hazard: Perchlorate</b>            Attention California users:            The battery supplied with this product may contain perchlorate material. Special handling may apply. See <a href="http://www.dtsc.ca.gov/hazardouswaste/perchlorate">http://www.dtsc.ca.gov/hazardouswaste/perchlorate</a> for information.</p>
Control Software	No	<p><b>Hazard:</b> &lt; &gt;</p> <p><b>Injury Prevention:</b> &lt; &gt;</p>
Electrical	No	<p><b>Hazard:</b> &lt; &gt;</p> <p><b>Injury Prevention:</b> &lt; &gt;</p>
Ergonomic	No	<p><b>Hazard:</b> &lt; &gt;</p> <p><b>Injury Prevention:</b> &lt; &gt;</p>
Gas	No	<p><b>Hazard:</b> &lt; &gt;</p> <p><b>Injury Prevention:</b> &lt; &gt;</p>
Hydraulic	No	<p><b>Hazard:</b> &lt; &gt;</p> <p><b>Injury Prevention:</b> &lt; &gt;</p>

**Table 2-1** Hazard Matrix

Potential Hazard	Present	Summary
Laser	No	<b>Hazard:</b> < > <b>Injury Prevention:</b> < >
Mechanical	Yes	<b>Hazard:</b> pinch points present at the Q2337 Imaging Head: <ul style="list-style-type: none"> <li>Between the Imaging Head and media transport.</li> <li>On the bottom plate of the Imaging Head.</li> </ul> <b>Injury Prevention:</b> keep fingers and clothing clear of pinch points.
Noise	No	<b>Hazard:</b> < > <b>Injury Prevention:</b> < >
Pneumatic	No	<b>Hazard:</b> < > <b>Injury Prevention:</b> < >
Radiation	No	<b>Hazard:</b> < > <b>Injury Prevention:</b> < >
Temperature	No	<b>Hazard:</b> < > <b>Injury Prevention:</b> < >
Ultrasonic	No	<b>Hazard:</b> < > <b>Injury Prevention:</b> < >

## MSDS

MSDS sheets may be obtained from the HP website located at [www.hp.com](http://www.hp.com).

## Personal Safety



**NOTE:** Check local regulations; in some areas ink is considered hazardous waste. Materials used for priming and recovery service must be disposed of according to local regulation. Go to [www.hp.com](http://www.hp.com) to obtain the MSDS Data Sheet.

**Table 2-2** Personal Protective Equipment (PPE)

Condition or Activity	PPE
Print Cartridge Recovery Service	Lab Coat, Goggles, Latex Gloves

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## Waste Management

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**CAUTION:** Ink is considered hazardous waste according to some local regulations. Always check local regulations before disposal. MSDS sheets may be obtained from the HP website located at [www.hp.com](http://www.hp.com).

**CAUTION:** Materials used for priming and recovery service must be disposed of according to local regulation.

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## 3 Precautions

The HP mPrinter 4000 Fixed Imager is designed to be virtually maintenance free. However, due to the nature of industrial environments some components in the Imager require a small amount of maintenance.

**CAUTION:** Do NOT clean the Imaging Module with compressed air if the printheads are not in the capped position. This may spray ink onto areas of the imaging head that must remain clean and free of ink. Even in the capped position, cleaning with compressed air is not recommended. Follow the Low Level Recovery Service procedures (see the *HP mPrinter 4000 Fixed Imager Integration Guide, 802896ce*) to perform a gentle cleaning when needed.

**CAUTION:** Always power down before disconnecting any cables. Disconnecting cables with the HP mPrinter 4000 powered will damage printed circuit board electronics.

**CAUTION:** Observe precautions for handling Electrostatic Sensitive Devices.



## Pinch Points

Two potential pinch point risks have been identified for the Q2337 Imaging Head.

1. Between the Imaging Head and media transport.
2. Insertion of a finger into the holes on the bottom plate of the Imaging Head.

**CAUTION:** The moving belt near the unit could injure fingers. Do NOT touch belt when operating.

**CAUTION:** The cleaning station may move unexpectedly and trap or injure fingers. Do NOT reach into the unit when it is powered.



**TIP:** Remember: cleaning station refers to the printhead cleaner carriage, printhead cleaners, and all of the components associated with the Service Station in the Imaging Module.

## Imaging Head and Media Transport



**CAUTION:** The media transport is rigidly mounted under the Imaging Head which creates the possibility of a pinch point between the Imaging Head and the media transport. To mitigate this risk, use light curtains to disable the media transport.

A system that monitors media transport motor torque that will cut power on torque spikes, to minimize the damage done in a pinch.

- A clutch on the media transport that disengages the drive if there is a pinch.
- Other sensors that will disable the media transport if a potential pinch occurs.
- Warning labels and operator training.

## Bottom Plate of the Imaging Head



**CAUTION:** The printheads protrude through the holes in the bottom plate of the Imaging Head. If the servicing module activates servicing while a finger is inserted into a hole, the service station could pinch a finger against the bottom plate.



# Supplies

**Table 3-1** Recommended supplies

## Recommended supplies

ITW Texwipes

de-ionized water

foam swabs

# Frequency

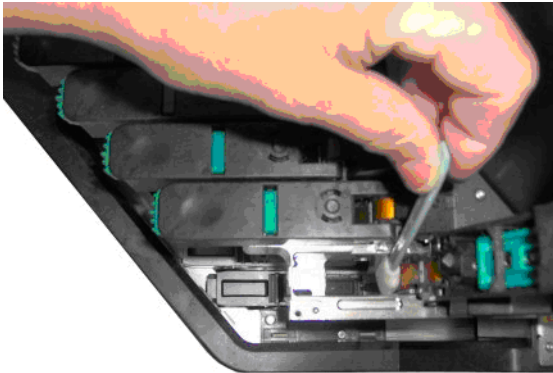


**NOTE:** See the *HP mPrinter 4000 Fixed Imager Integration Guide, 802896ce* for all information on maintenance of printheads.

**Table 3-2** Maintenance schedule

Maintenance procedure	each printhead change	weekly or as needed	every 6 months
Inspect & clean flex circuit	X		
Clean flex cables		X	
Clean imaging head bottom		X	
Inspect sliding/moving surfaces		X	
Slide & lead screw operation			X
Inspect Imager Controller air filter			X
Run alignment plot	X	X	X

# Flex Circuit Cleaning Procedure



1. Inspect the flex circuit where it connects to the printhead.
2. Lift the latch handle up and gently pull upward to remove each printhead from the Imaging Head.
3. Inspect the flex connector for ink spray.
4. If any contamination or discoloration is observed, clean the interconnect and printhead.
5. Use a foam swab to gently wipe the contacts and flex cable.
6. If needed, moisten a foam swab with de-ionized water and gently wipe the printhead.
7. Change the printhead cleaner.
8. Run an alignment plot to ensure the best print quality.

# 4 Troubleshooting/Service & Repair

## Introduction

Any person performing a warranty service repair must be trained and authorized to perform repairs. Hewlett Packard provides the initial training to the OEMs trainer; OEMs are responsible to train their personnel and maintain proficiency of their personnel.

All warranty service incidences must be properly and thoroughly documented using the [Warranty Incident Report](#). These repair records along with the defect materials are used to analyze failures, watch for trends, and finally to drive the proper corrective action.

This Troubleshooting / Service and Repair chapter includes the following:

- Description of system setup for troubleshooting, independent of the OEM's system
- Description of tools required
- Troubleshooting flowcharts
- Description of, and user's guide for, the diagnostic tool (HP Imager Test Center)
- Description of the warranty repair incident documentation

You may also want to refer to the [Replacement Parts](#) chapter, and the current Error Codes document (see the *HP mPrinter 4000 Fixed Imager Firmware/Software Integration Guide* (80074a73), for further information.

## General

The HP mPrinter 4000 requires all the modules to be connected via the system external cables to work or to perform any troubleshooting. The controller provides power and control to both the IDS and imaging module; therefore there is no method to test a module independently. The Imager Test center is designed so technicians can troubleshoot the modules without instruments such as multimeters. Multimeters may be used to check for cable continuity, but should not be used to check the PCAs. The only tools needed are listed in the following section.

## Equipment

- Controller PCA troubleshooting Kit:
  - Encoder Generator, Q2327-60011
  - Encoder cable, Q2326-60046
  - TOF to OEM I/O cable, Q2326-60023
- Personal computer with:

- LAN connectivity
- IP address set to 192.168.1.2
- Subnet mask set to 255.255.255.0
- Cat 5e crossover cable to connect PC with Engine PCA test fixture
- Imager Test Center Diagnostic SW
- Imager to Printhead Cleaner Calibration tool

## Repair Cautions



**CAUTION:** Observe precautions for handling Electrostatic Sensitive Devices.

**CAUTION:** Never disconnect external cables with power on; ALWAYS turn the controller off before disconnecting any external cable.

**CAUTION:** Due to the use of commercial sub-assemblies, there are both English and Metric fasteners. Care must be taken to avoid mixing fasteners.

**CAUTION:** Never change any of the externally accessible hardware; specifically screws on the controller. Doing so may damage or short the internal electrical components.



## LEDs

The HP mPrinter 4000 is equipped with internal and external LEDs to identify status. The following sections provide a summary of the LEDs on modules.

### HP mPrinter 4000 Imaging Module

Pen Bi-Color LED: The LED does not emit until the software controls the LED. It is either RED or GREEN based on the status of the PEN/Flex interface. It starts out RED then turns to GREEN indicating a functional status has been detected by SW.

### HP mPrinter 4000 Imager Controller

The Controller front panel has three LEDs:

- GREEN: will emit whenever the BIOS is operating correctly and the unit is **not** in low power (Standby) mode. During Active ATX power (when the CPU is powered up) Green LED will emit; if in the low power mode the Green LED will **not** emit.
- YELLOW: signifies that there is hard drive activity.

- BLUE: signifies that the software is active. The Blue LED will be off, Strobing or Always On. Off means the controller is in Standby mode or has no AC power. Always On indicates the software has frozen. Strobing is an indication the Print Engine software is functional.

---

## HP mPrinter 4000 Ink Delivery System

The LED will emit Red when power is applied under the Print Engine software. When the software is progressed in the Boot cycle, the LED will emit Green. The OEM customer has the ability to change the color to Yellow, and/or flash it etc. The LED located on the SVS is the first LED to emit, once the IH is powered under software control.

---

## Internal LEDs (mounted on PCAs) Reference Designators

---

### HP mPrinter 4000 Imager Controller

#### Engine PCA

- DS3: 2.5V is on
- DS2: 1.8V is on
- DS1: 3.3V is on

#### Interconnect PCA

- DS1: 24V input is on
- DS7: 24V is on (to IDS, Brick Servo, Encoder/TOF connectors)
- DS4: 12V is on
- DS6: 5V is on
- DS3: 3.3V is on

---

### HP mPrinter 4000 Ink Delivery System

- DS1: 5V is on

---

## OEM Interface and Error Codes

There are several troubleshooting aids. The first is an error message generated via the software that will be displayed through the OEM interface. For a list of error codes generated and the associated procedures please refer to the *Software/Firmware Integration Guide* (80074a73). This guide will provide a series of flowcharts designed to quickly identify potential faults and their solutions.

Because the error codes are managed by the Master Controller and displayed to the user in the OEM GUI, it is the responsibility of the OEM to assure that the correct message is displayed per their criteria. The HP error codes given in the *Software/Firmware Integration Guide*, 80074a73 are the codes and messages from the HP mPrinter 4000 controller; the OEM must decide what is displayed to the user.

---

## Normal Operation Sound and Visual Signals

The HP mPrinter 4000 uses sound and LED signals to help troubleshoot a unit. All personnel using and/or repairing a unit should be familiar with the proper LED signals and sound signals the system makes, during normal start and some problems. The signals do not cover all circumstances, but aids with troubleshooting.

---

## Troubleshooting Guide

The HP mPrinter 4000 requires that the controller has booted, therefore the flowcharts provided help field technicians get to that state. Once the controller is booted, the Imager Test Center can be used to facilitate troubleshooting of the System.

---

## Imager Test Center

HP has developed the Imager Test Center diagnostic tool to assist in troubleshooting. This tool is loaded onto a laptop computer and connects to the HP mPrinter 4000 via the LAN card using a crossover cable. This allows field technicians or manufacturing personnel to test the HP mPrinter 4000 to assure proper functionality independent from the OEM's system. During this diagnostic tool usage, the HP mPrinter 4000 is disconnected electrically from the OEM's system control. Error codes generated during the test help the technician zero-in on the problem and part, to replace the defective parts. Replacement parts procedures are in the [Replacement Parts](#) chapter beginning on page 99 of this manual. However, the Imager Test Center is not meant to replace good troubleshooting techniques developed by repair technicians.

---

## Warranty Incident Report

The warranty incident report form is shown below (page 27). Any time an OEM repairs or returns a unit to HP, the OEM is responsible for assuring that all warranty incidences are documented properly using this form. The form is created for use by both HP and OEMs; data entered in it is used to populate the warranty database. From the warranty data analysis, corrective action is initiated for statistically significant issues.

Also, the OEM is responsible for returning the defective parts in the approved shipping container, for validation and failure analysis by HP. HP's goal is to create a synergistic quality system with the OEM that provides timely response to real issues by providing data, proper issues tracking, and ultimately proper corrective action, to keep warranty cost and issues to the lowest possible level.

Following are the definitions for the items listed in the Warranty Incident Report:

	Recorded by	Item	Description
1	OEM	RMA	Return Materials Authorization. This is the number assigned by HP to a specific part(s) which allows the OEM to ship items back to HP while also allowing HP to track the items once they are back for analysis.
2	OEM	Serial Number	This is the 10 character serial number assigned to a module. Specifically, it is the serial number for the module that the incident report is written against.
3	OEM	Module Number	This is the model number of the module, found on the serial label on the back or bottom of the unit.
4	OEM	Date Received	This is the date the unit was received by the OEM. This is an optional entry.
5	OEM	Date Completed	This is the date that repair was completed by the repair technician.
6	OEM	Fail Date	Date of product failure.
7	HP	Original Ship date	This entry date is for HP.
8	OEM	Customer	This is an optional entry for the OEM if they are willing to share the end user's name.
9	OEM	Customer Code	This is an entry code that describes the problem, as seen by the customer. The code will be shared with the OEM.
10	OEM	Diagnostic Error Code	This is the code reported by the Imager Diagnostic Test program.
11	OEM	Customer Complaint & Diagnostics	This is a free-form area for the service technician to report issues found or diagnosed by the user.
12	HP or OEM	HP Technician	This identifies the HP technician performing the defect part failure analysis.
13	OEM	OEM Technician	This identifies the authorized service technician that must be listed as having satisfactorily completed the HP training.
14	HP or OEM	Initial Condition	This includes comments on the initial condition of the part as received at HP (i.e.: was it packaged per the agreement?).
15	HP	Initial Diagnostic by HP	The initial diagnostic by the HP technician trying to replicate the issue reported by the OEM or/and end user.
16	HP or OEM	Repair Code	A systematic code to allow sorting of issues and Statistical Analysis; see <a href="#">Repair and Fail Codes</a> for table of codes.

	Recorded by	Item	Description
17	HP or OEM	P/Ns Replaced	Part number of parts replaced.
18	HP or OEM	Serial Number	Serial number of NEW unit replacing the suspect part (when s/n is available). See <a href="#">Part / Serial Number Locations in Replacement Parts</a> for the locations of assembly serial number labels.
19	HP or OEM	Reason code	The reason for the replacement.
20	HP or OEM	Comments	Free-form comment by HP technician.
21	HP or OEM	Replacement Module P/N & S/N	This is the part number and serial number of the replacement module.



**NOTE:** Items recorded by HP are only during the period that HP performs repairs.



## Service Event Documentation & Service Event Report

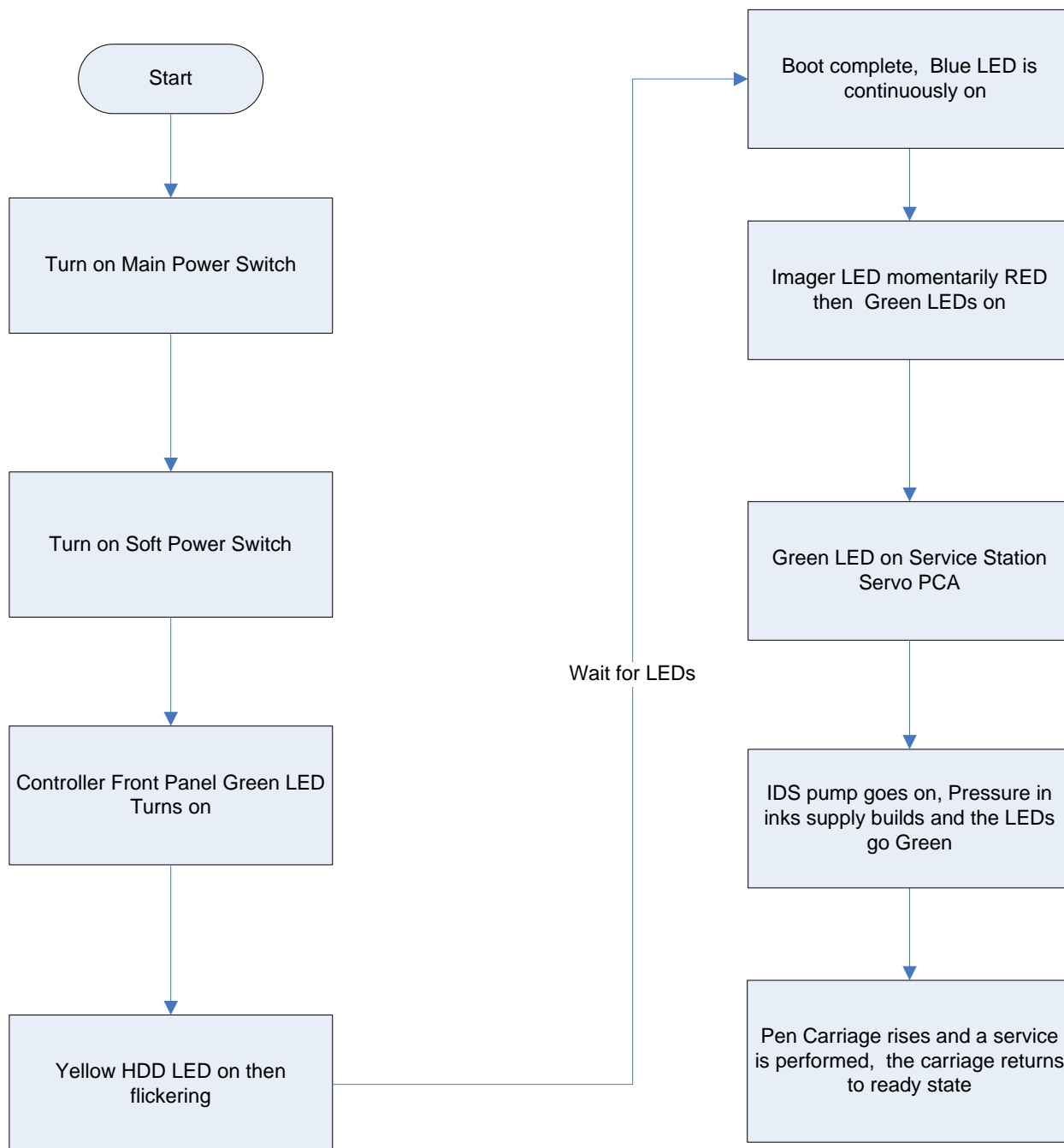
RMA no.	Serial Number	Module p/n	Date Recieved	Date Complete	
Fail Date	Original Ship Date		Customer		
Customer Code		Diagnostic Error Code			
Customer Complaint & Diagnostics					
HP Repair Technician			OEM TECH		
Initial Condition					
Initial Diagnostic by HP			Repair Code		
P/Ns Replaced	s/n	Reason Code	P/Ns Replaced	s/n	Reason Code
Comments					
Replacement Module		if replaced			
P/N		S/N			

**Figure 4-1** Warranty Incident Report

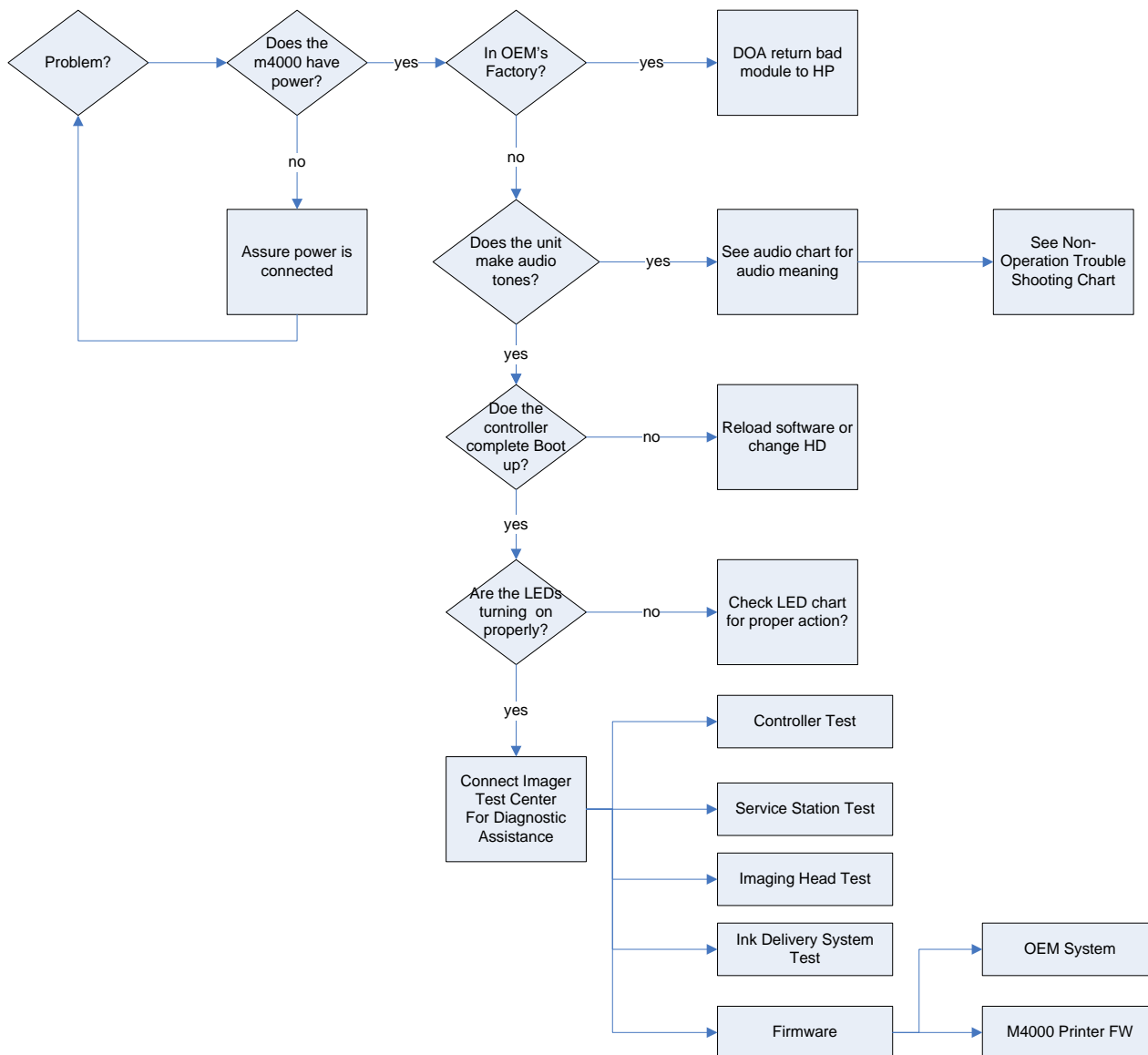
# Troubleshooting Flowcharts

Use the following flowcharts to troubleshoot the Imager system.

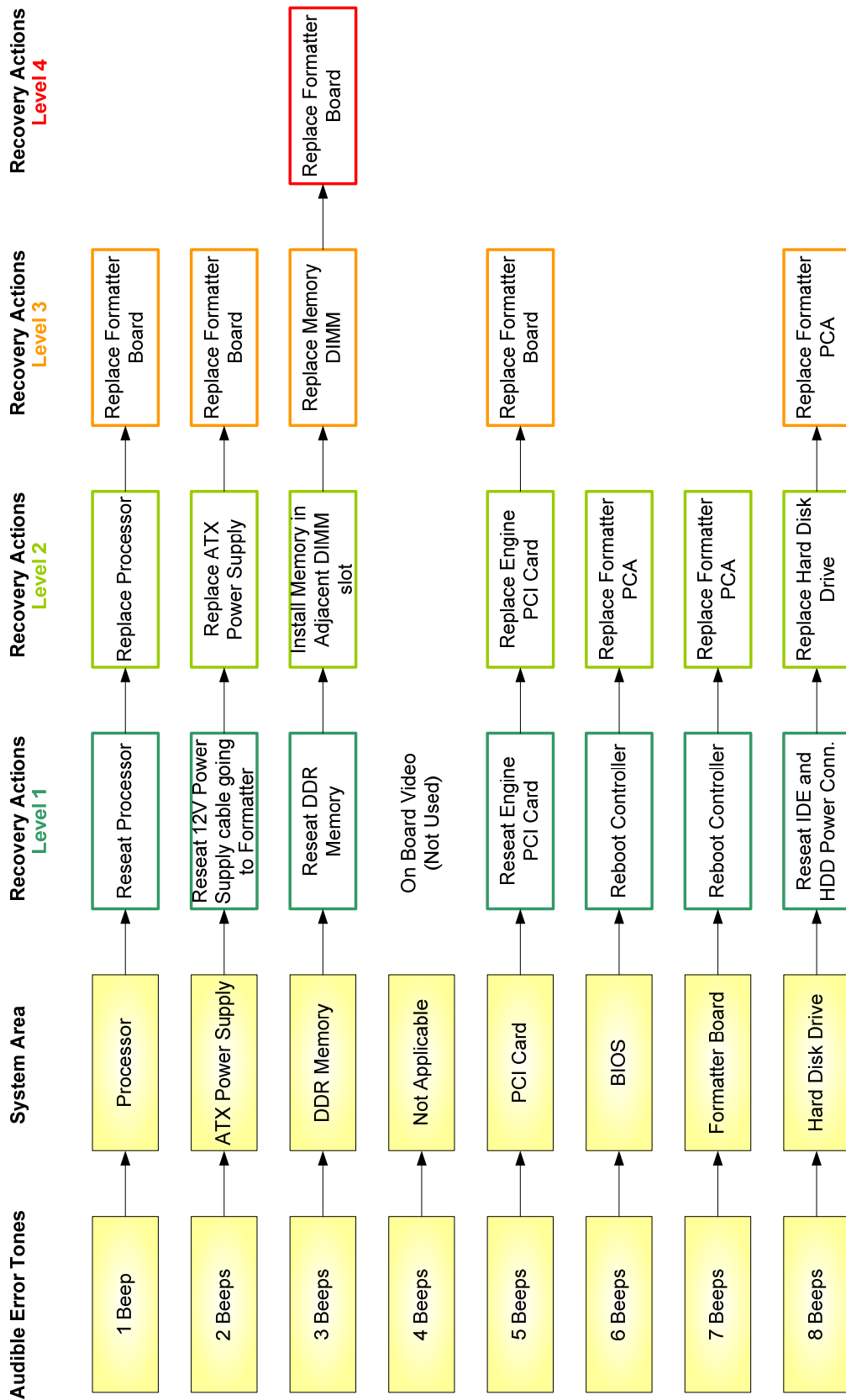
## Normal Start Up



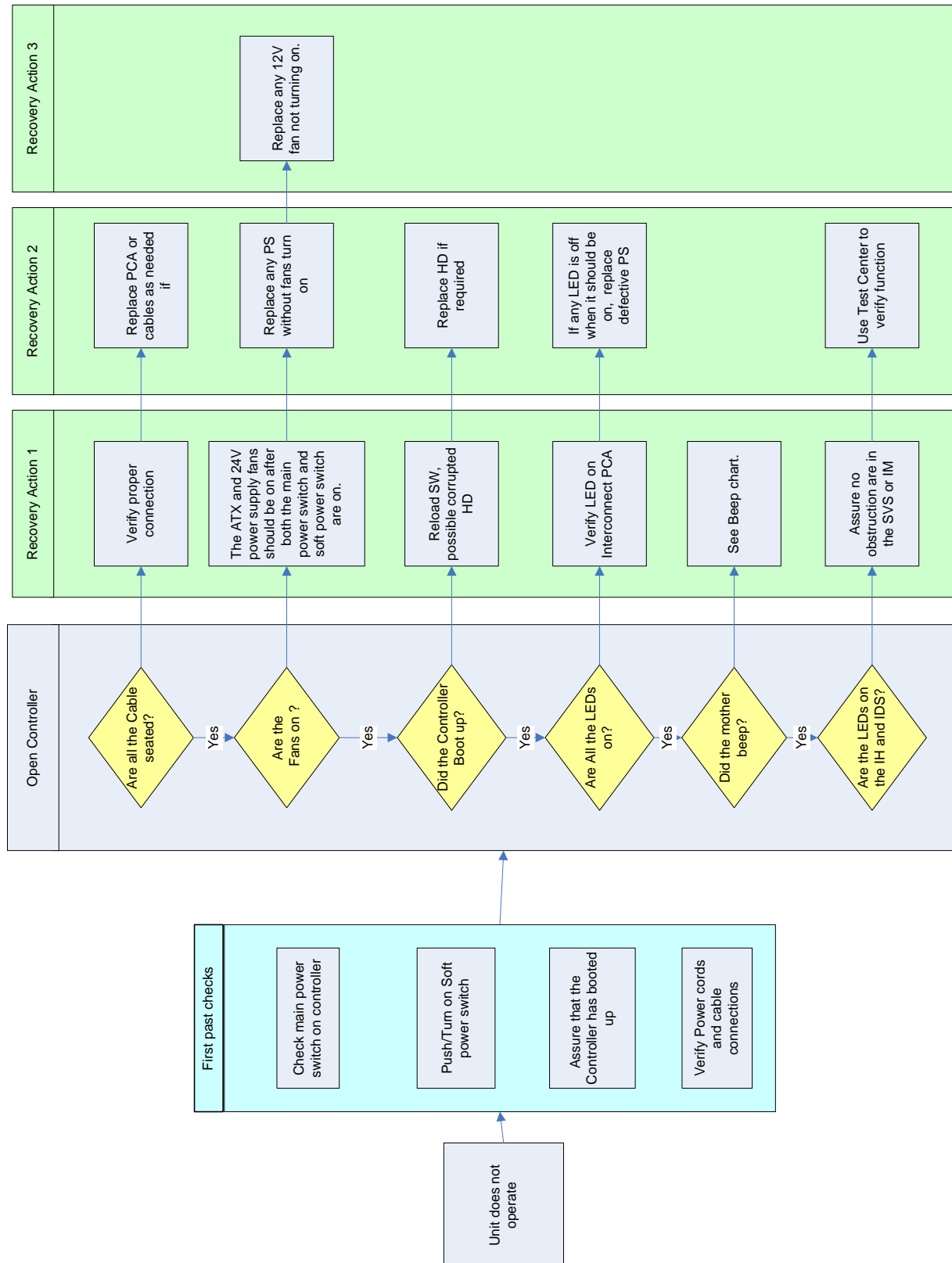
# Troubleshooting Hierarchy



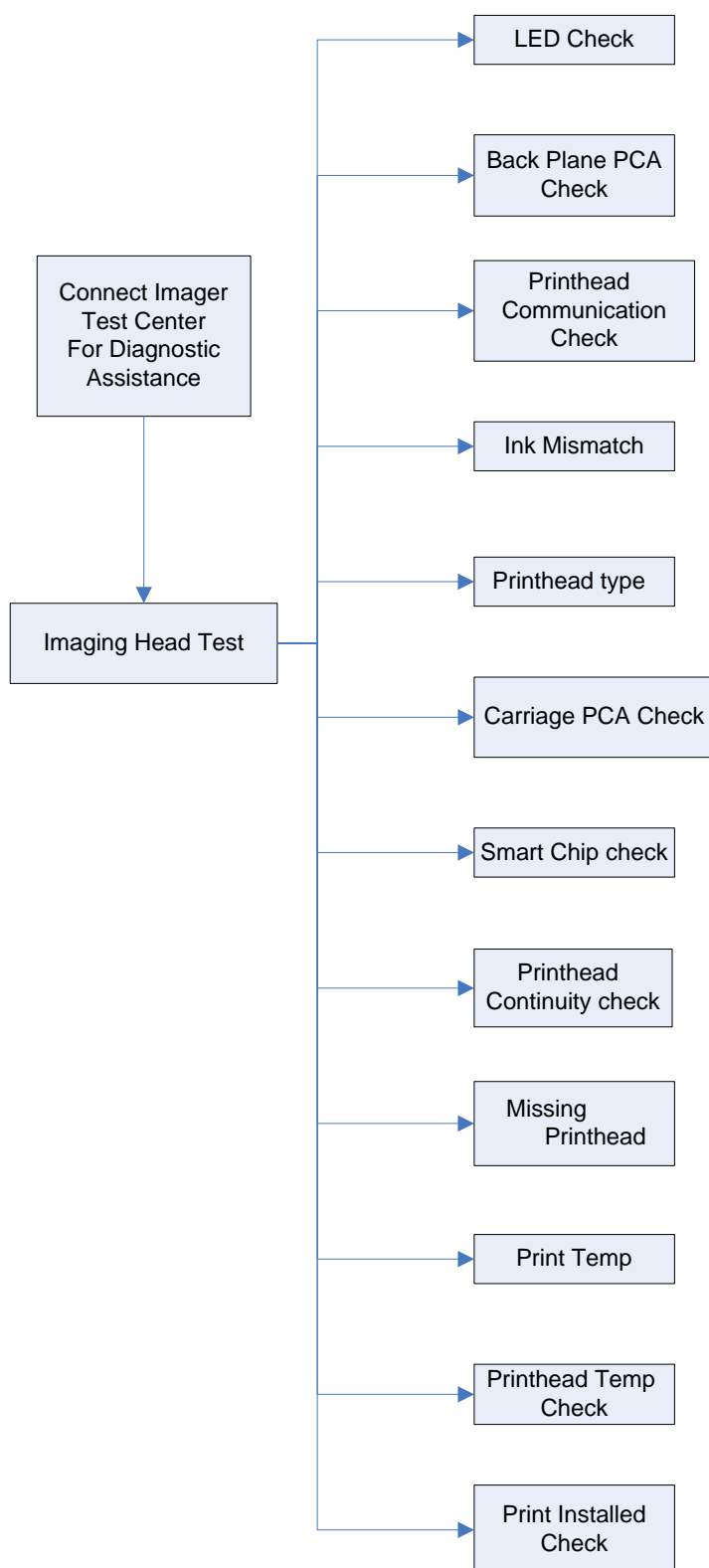
# E-Buzzer Detected Faults



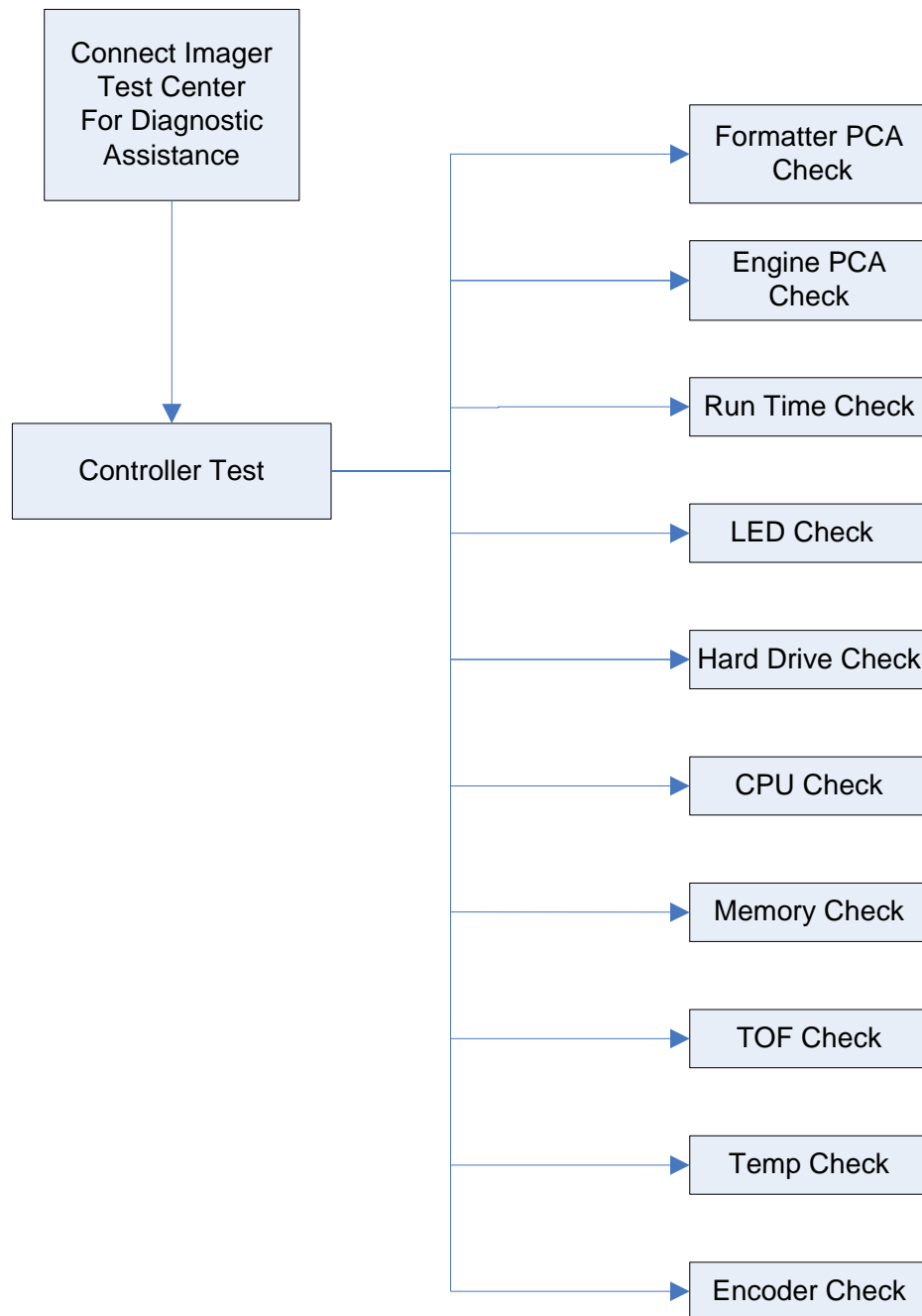
# Non Operation Steps



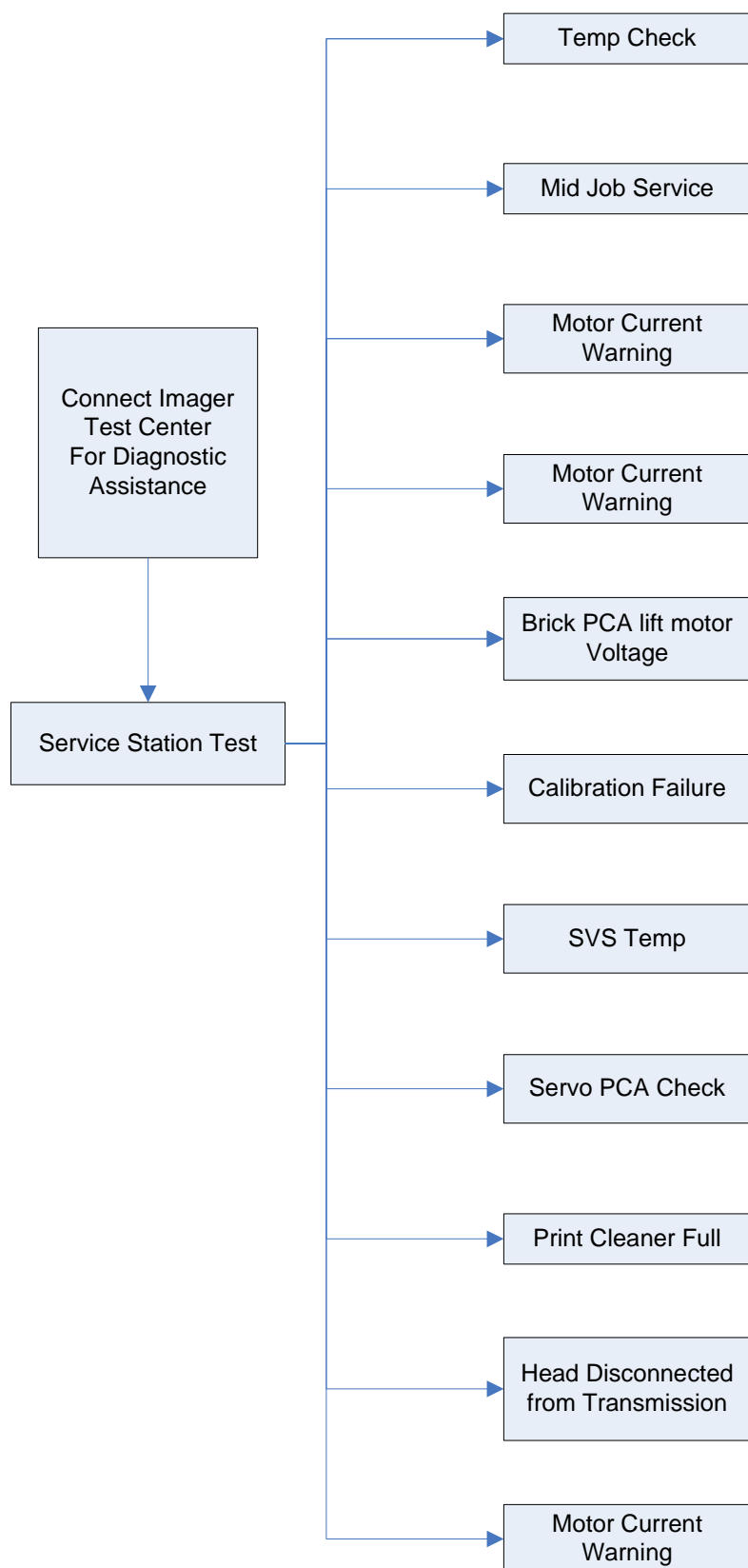
## Imager Diagnostic Test



## Controller Diagnostic Test

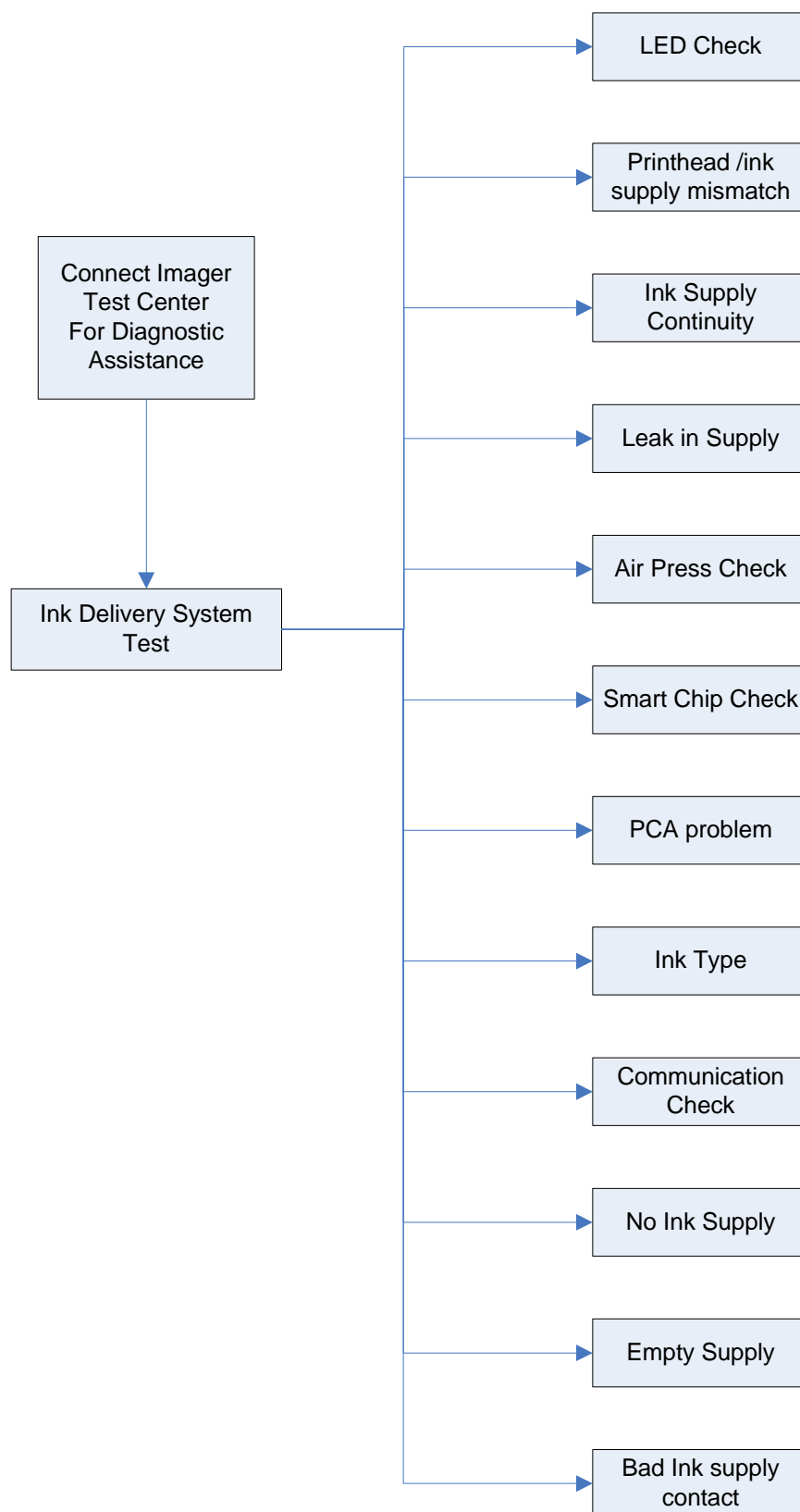


## Service Station Diagnostic Test

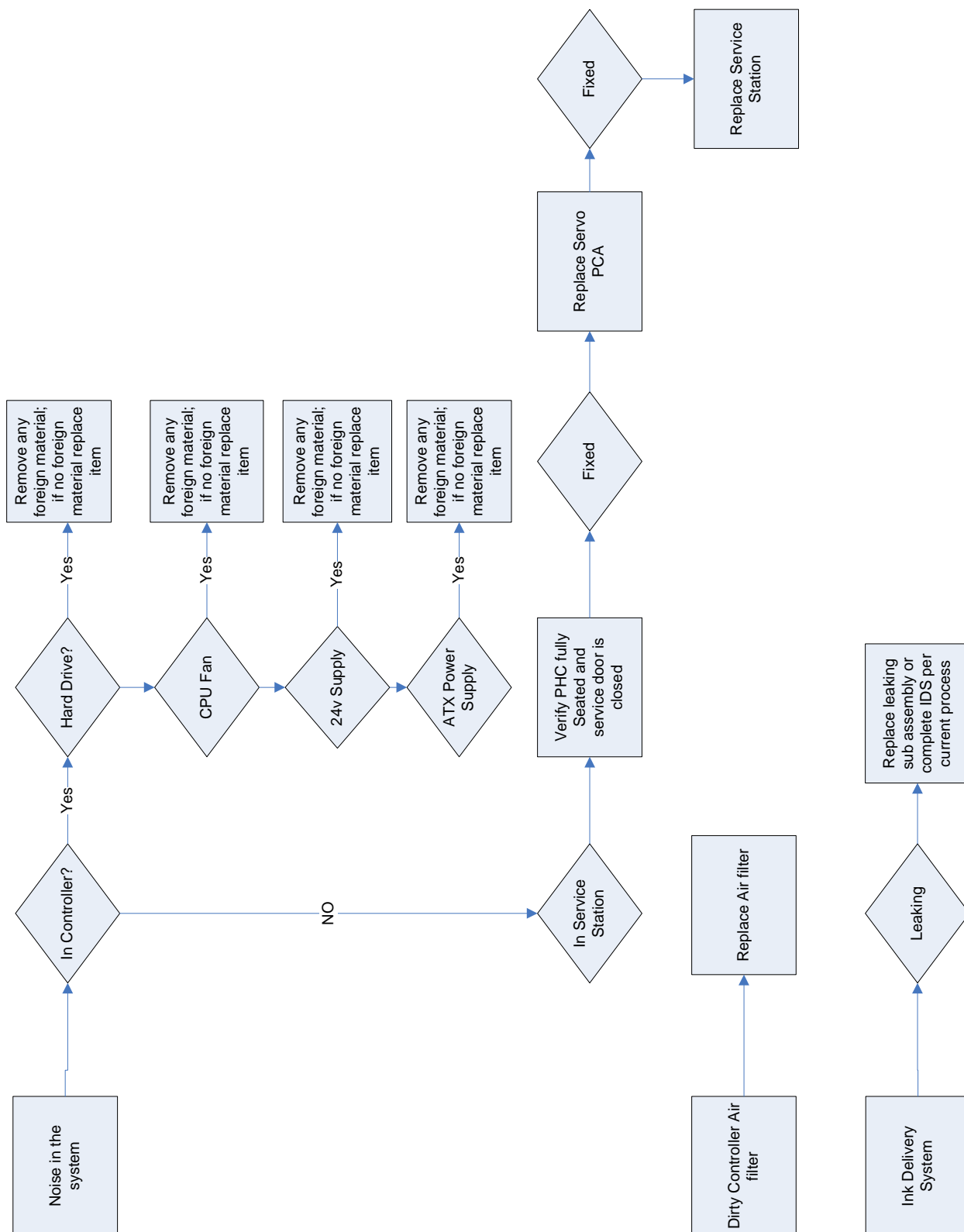




## IDS Diagnostic Test



## Noise and Miscellaneous Items



## LEDs & Recovery Actions

External LEDs	Recovery Action 1	Recovery Action 2	Recovery Action 3
Imager Pen Bi-color LED	Reseat flex circuit into ZIF connector	Replace latch/flex assembly	
Imager, Service Station Servo PCA	Check external cable connection	Check internal cables	Replace Servo PCA
Controller Front Panel Blue	Check software for corruption, re-install software	Replace hard drive	
Controller Front Panel Green	Check cable to Formatter PCA	Check microprocessor seating	Check ATX power supply
Controller Front Panel Yellow			
IDS Front Panel	Check external cable	Verify 5v on DS1, check internal cable	Replace cables
Internal LEDs	Recovery Action 1	Recovery Action 2	Recovery Action 3
<b>Engine PCA</b>			
DS3	Check internal cable	Change ATX power supply	
DS2	Check internal cable	Change ATX power supply	
DS1	Check internal cable	Change ATX power supply	
<b>Interconnect PCA</b>			
DS1	Check internal cable	Change ATX power supply	
DS7	Check internal cable	Change ATX power supply	
DS4	Check internal cable	Change ATX power supply	
DS6	Check internal cable	Change ATX power supply	
DS3	Check internal cable	Change ATX power supply	
<b>Ink Delivery System</b>			
DS1	Check external cable	Check internal cable	

# Print Quality / Operation Troubleshooting

Review the following tables for print quality troubleshooting and correction procedures.

**Table 4-1** Operation troubleshooting

Symptom	System area	Action (perform in order listed; stop once an action restores function)
random banding nozzle outs or misdirected nozzles	print quality	<ol style="list-style-type: none"> <li>1. Initiate quick service algorithm, verify that the nozzles have recovered.</li> <li>2. Initiate super clean algorithm, verify that the nozzles have recovered.</li> <li>3. Perform manual printhead service (wet wipe).</li> <li>4. Remove the printhead, clean the contacts, reseal the printhead.</li> <li>5. Replace the printhead.</li> </ol>
printhead to printhead vertical misalignment (visible stitch lines)		<ol style="list-style-type: none"> <li>1. Perform a manual alignment, verify that the print quality is restored.</li> <li>2. Initiate super clean algorithm, verify that the nozzles have recovered.</li> <li>3. Replace the printhead.</li> <li>4. Replace the imaging module.</li> </ol>
printhead to printhead horizontal misalignment (printhead to printhead image not aligned in paper path axes)		<ol style="list-style-type: none"> <li>1. Perform a manual alignment, verify that the print quality is restored.</li> <li>2. Verify that the encoder system is within specification and is making good contact with the paper transport.</li> <li>3. Reseat the printhead.</li> <li>4. Reboot the system.</li> </ol>
nozzles and image fading in and out while printing		<ol style="list-style-type: none"> <li>1. Check the status of the supplies, change as needed.</li> <li>2. Verify that the ink delivery system is not positioned too far below the printheads (out of spec).</li> </ol>
garbled print image		<ol style="list-style-type: none"> <li>1. Cancel and restart the print job.</li> <li>2. Reboot the system.</li> </ol>
imager communication failure (LAN)	communication w/ imager	<ol style="list-style-type: none"> <li>1. Check the client IP settings, attempt to ping the Imager IP address.</li> <li>2. Check the LAN cable, verify that the proper LAN infrastructure is used in connecting the Imager.</li> <li>3. Replace the LAN cable.</li> <li>4. Check the status using the RS-232 interface. If the system does not boot, replace the hard disk.</li> </ol>

**Table 4-1** Operation troubleshooting

Symptom	System area	Action (perform in order listed; stop once an action restores function)
RS_232 Imager communication failure		<ol style="list-style-type: none"> <li>1. Check the client serial port settings - reboot the controller.</li> <li>2. Ensure that the RS-232 cable is a null modem cable. Replace the RS-232 cable.</li> <li>3. Replace the hard disk or load new software.</li> <li>4. Replace the formatter PCA.</li> </ol>
Ink leak in imaging head detected	imaging module	<ol style="list-style-type: none"> <li>1. Replace the ink tubes.</li> </ol>
IDS ink leak detected, printhead drooling	IDS / printhead	<ol style="list-style-type: none"> <li>1. If it is leaking at the valves, replace the air pump valve assembly.</li> <li>2. If ink is leaking at the stall, replace the ink cartridge stall assembly.</li> <li>3. If ink is leaking at the ink tubes, replace the ink tubes.</li> </ol>

---

# Imager Test Center User's Guide

The Imager Test Center User's Guide steps the user through the Imager Test Center. The Imager Test Center is the diagnostic tool used to test the HP mPrinter 4000 electronically, for electronic faults or operational faults. Like any other diagnostic tool, there are limitations on the Imager Test Center capabilities. Because it tests the electronics, it will not detect all mechanical faults; therefore, technician training and familiarity with the HP mPrinter 4000 is very important.

The Imager Test Center reports error codes; these error codes with their explanation and recovery actions are found in a read-only Excel spreadsheet provided with the Test center. Technicians can use this tool to systematically diagnose and repair a module.

The following section will start with the initial Imager Test Center window and step through the diagnostic tool. Common steps and information are included in the [Startup](#) section beginning on page 41. The intent is to show and explain the menu bar and drop down menus. See also the [Repair Validation](#) and [RS-232 Port and OEM Troubleshooting and Maintenance](#) chapters for further related information.



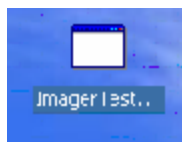
**IMPORTANT:** The system must be rebooted to allow the proper settings to register. Failure to reboot before returning to printer mode will cause problems.

---

# Startup

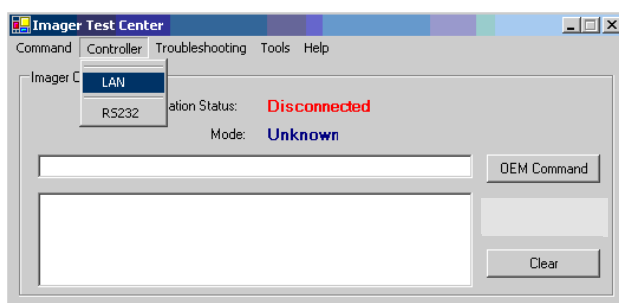
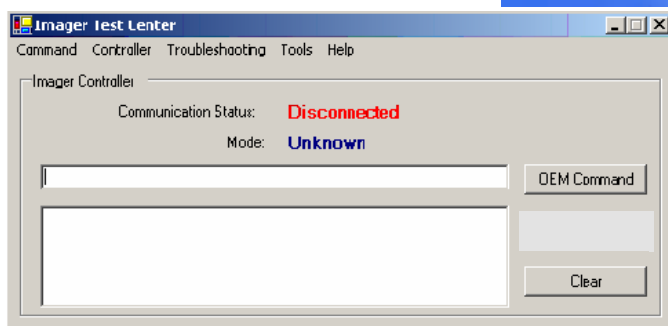
## Illustration

## Description



### Connecting the Controller

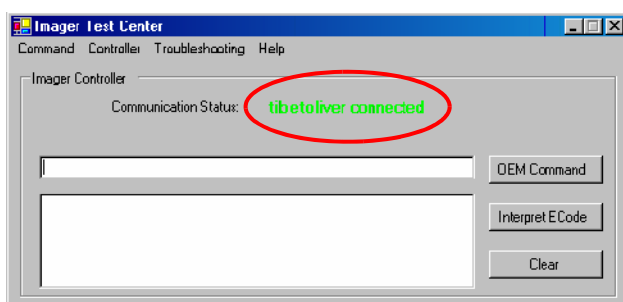
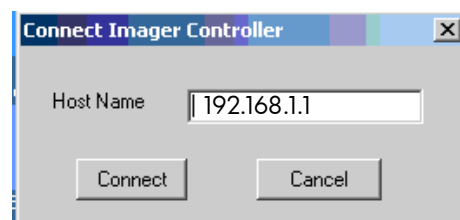
Click on ImagerTest icon as shown to open the Imager Test Center.



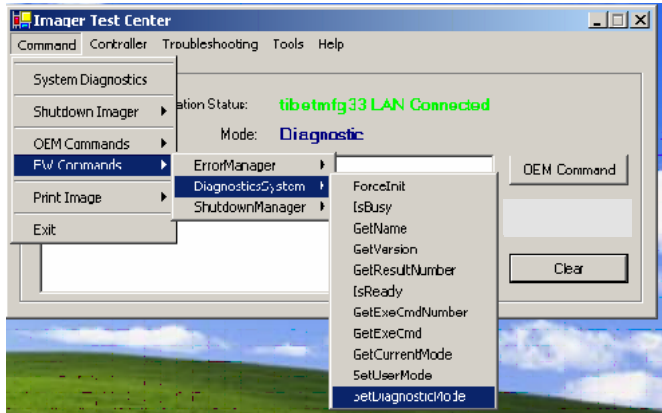
Click the Controller tab and select LAN to connect.

**NOTE:** This command is also used to connect using the RS-232.

Type the Host Name in the appropriate field and press **Connect**.



Communication Status will turn green meaning that the unit is connected.

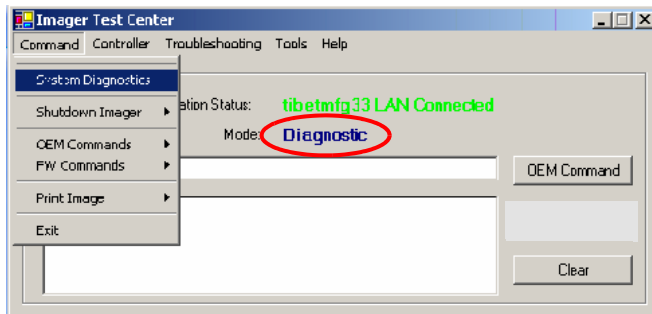
**Illustration****Description**

## Diagnostic Mode

Before running any test the software has to be set in Diagnostic mode.

Click on Command > FW Commands > Diagnostics System > SetDiagnosticMode.

**NOTE:** The unit must be rebooted after setting in diagnostic mode.



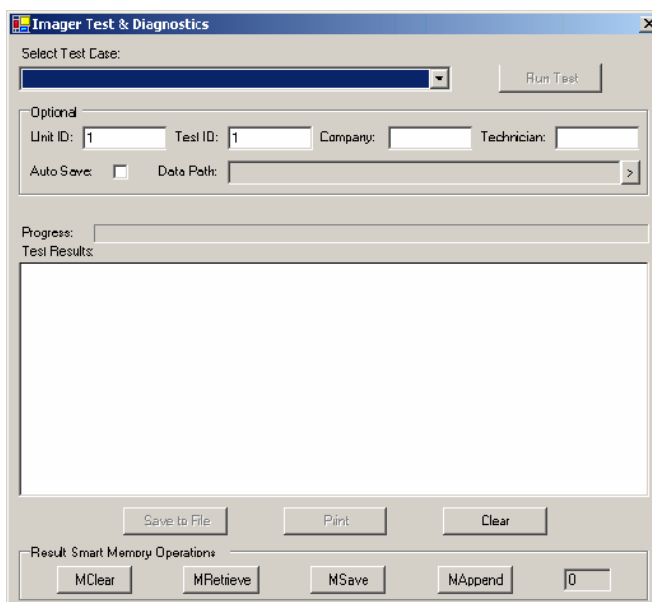
## System Diagnostics

The window shows that the system is in Diagnostic mode.

Click on Command > System Diagnostics.

**Note:**

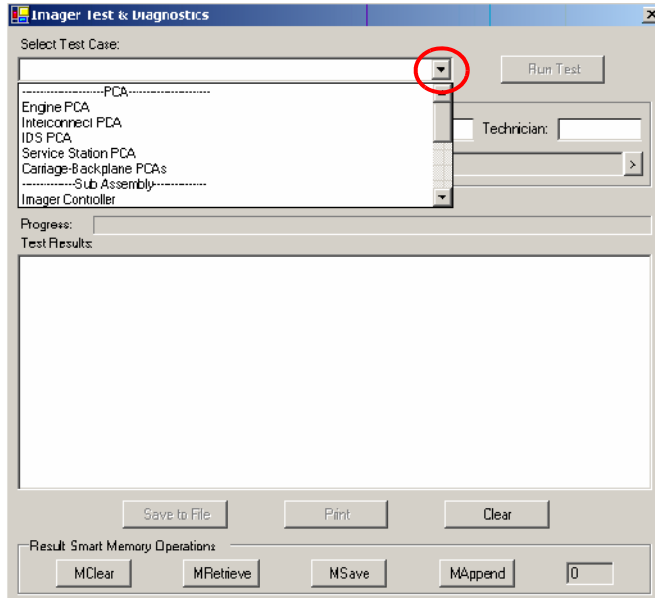
- Controller - Software Active light stays solid
- IDS LED's stay orange



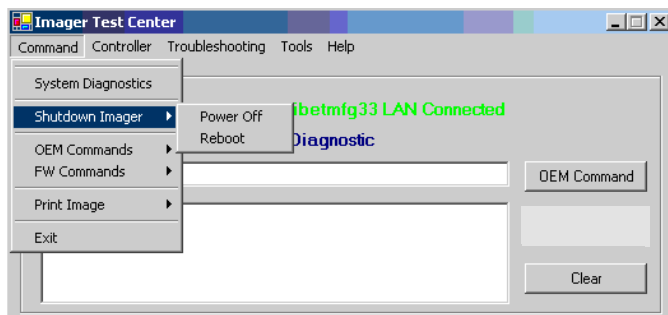
The screen shown at left will appear. The pull-down menu under Select Test Case lists all the available diagnostic tests.

The screen also allows the technician to enter useful data such as Unit ID, Test ID, Company, and Technician.

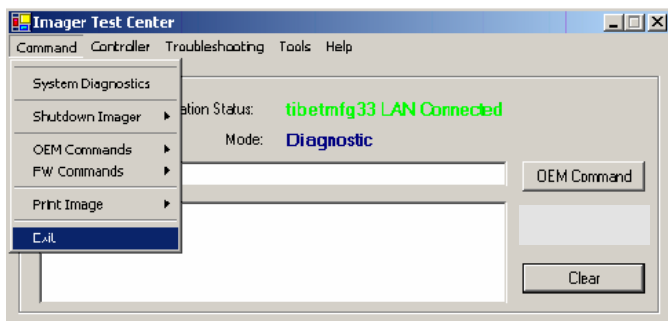


**Illustration****Description**

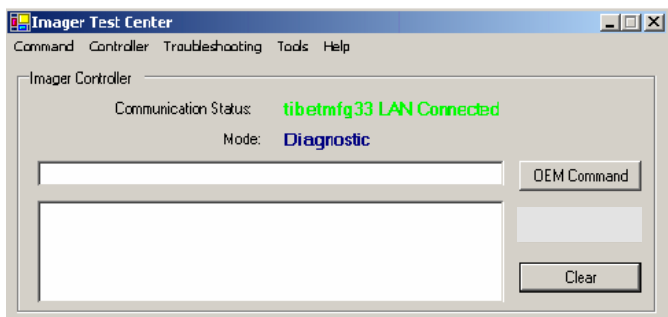
Click on the arrow to select a diagnostic test.

**Shutdown Imager**

Click on the Command menu, select Shutdown Imager, and choose either Power Off or Reboot.

**Exit**

Click on Command > Exit to depart from the program.

**Imager Test Center GUIs**

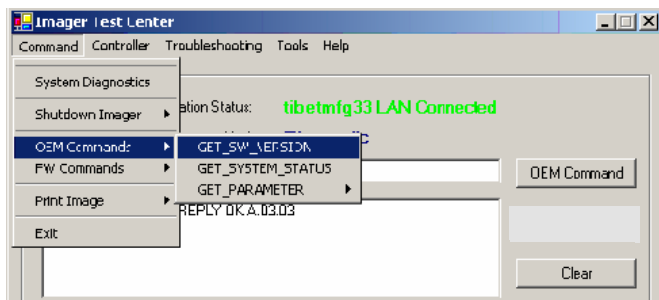
The **OEM Command** button allows the user to type in different commands to set or check certain values on the Imager.

The **Clear** button allows the user to clear the window.

# OEM Commands

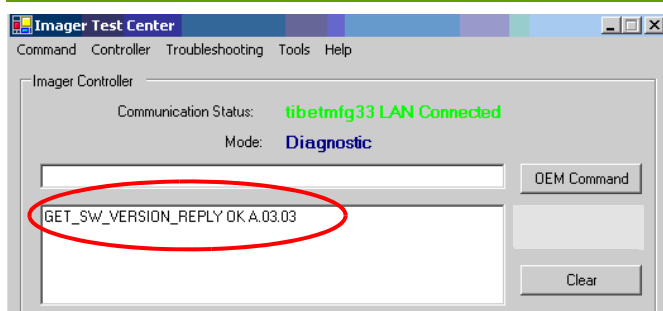
## Illustration

## Description

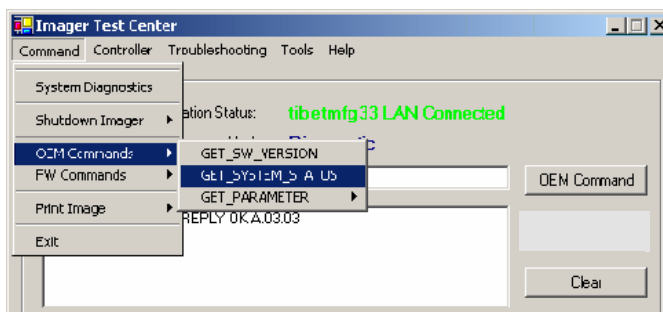


### GET\_SW\_VERSION

Click on Command > OEM Commands and select GET\_SW\_VERSION.

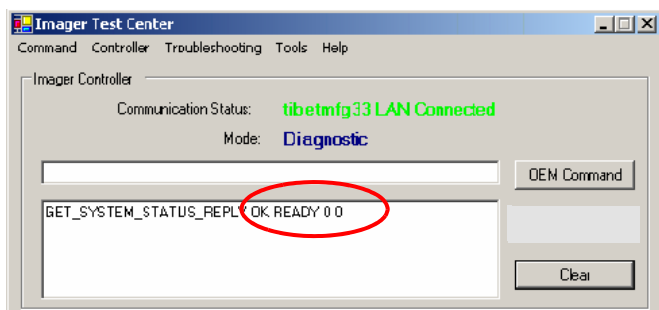


Window will display the version information for the software code.



### GET\_SYSTEM\_STATUS

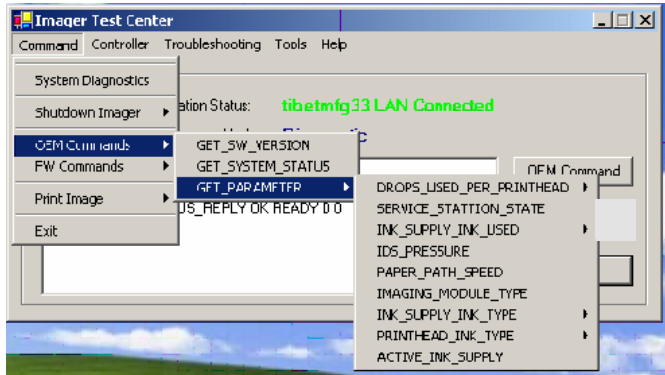
Click on Command > OEM Commands, and GET\_SYSTEM\_STATUS.



Window will show status.

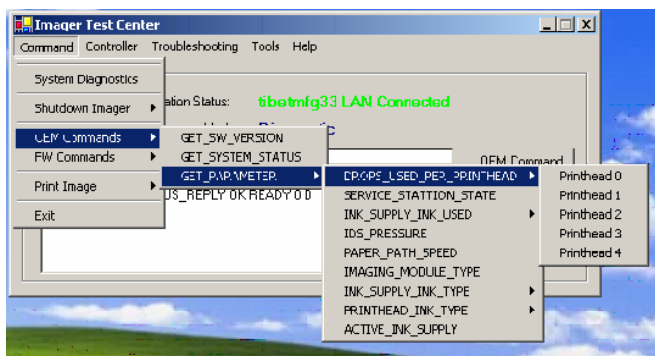
## Illustration

## Description



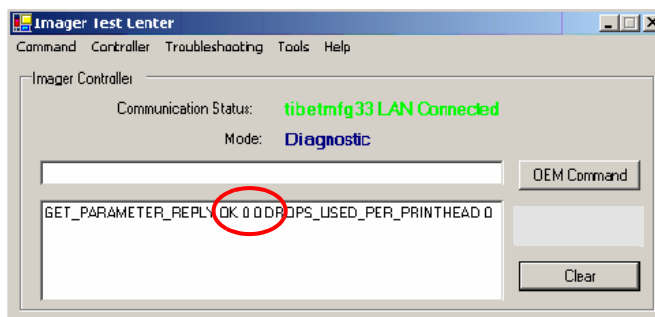
## GET\_PARAMETER

Click on Command > OEM Commands, and GET\_PARAMETER to get a list of different options you can choose from.



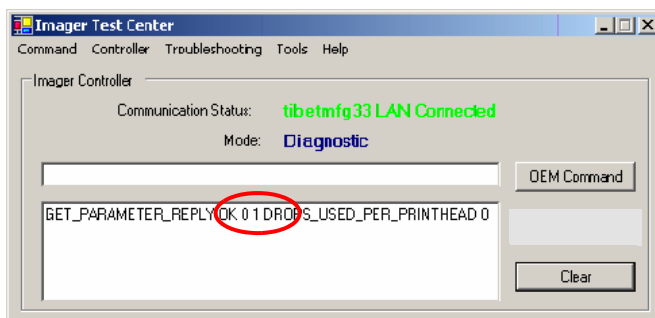
Click on Command > OEM Commands > GET\_PARAMETER, and select DROPS\_USED\_PER\_PRINHEAD.

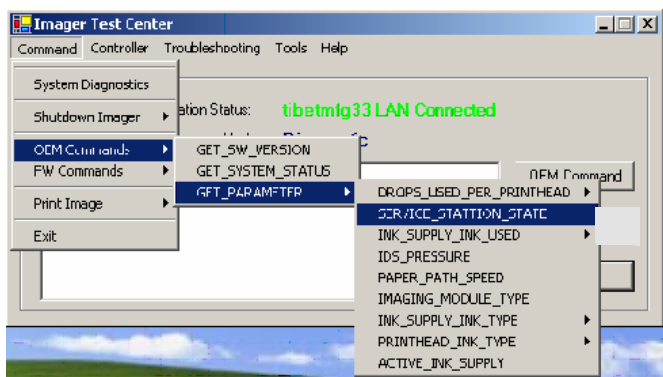
Select a Printhead to check drops used.



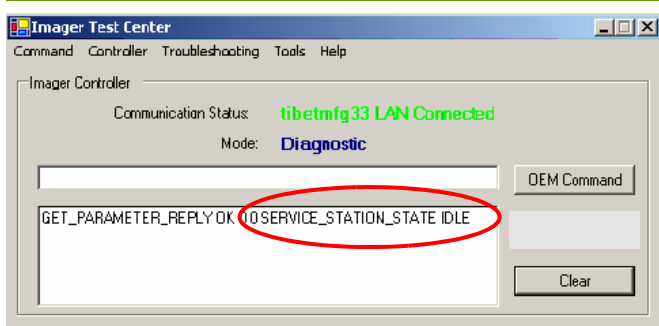
After selecting a Printhead a window will appear displaying the results.

The second number before DROPS\_USED is the printhead number.

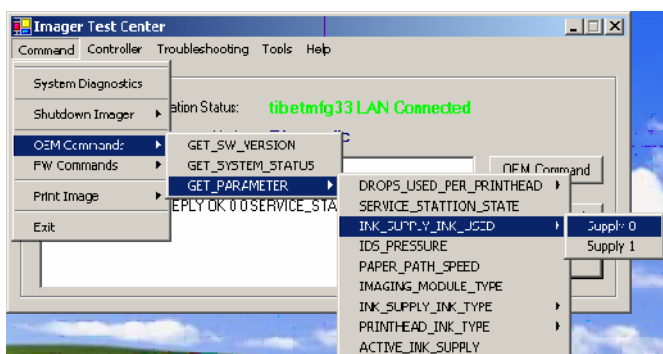


**Illustration****Description**

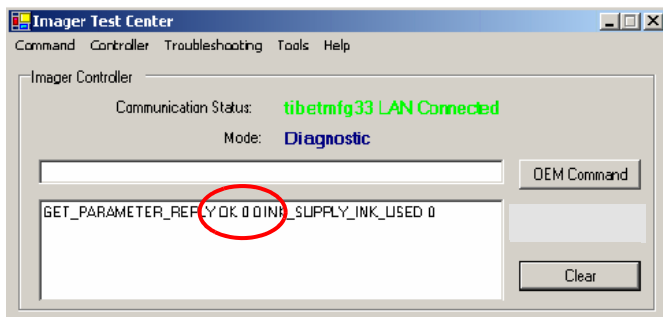
Click on Command > OEM Commands > GET\_PARAMETER, and SERVICE\_STATION\_STATE.



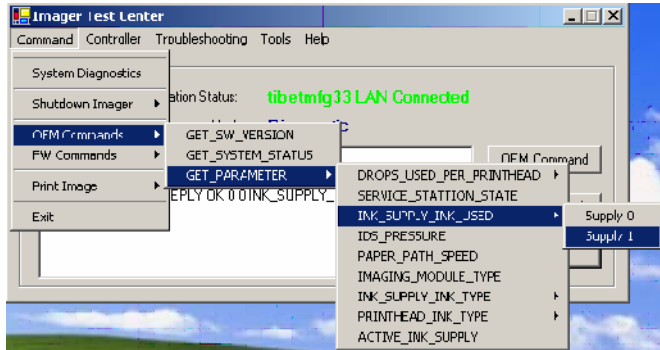
The window shows the status of the Service Station.



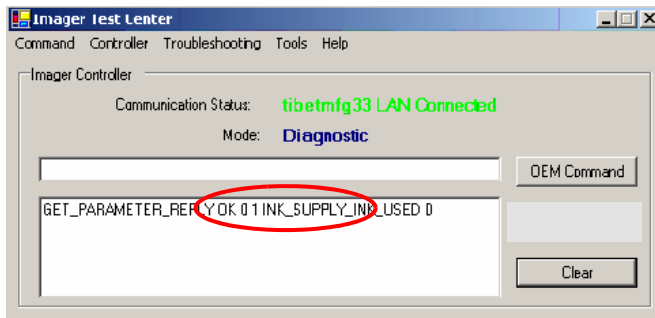
Click on Command > OEM Commands > GET\_PARAMETER, and INK\_SUPPLY\_INK\_USED. Choose Supply 0.



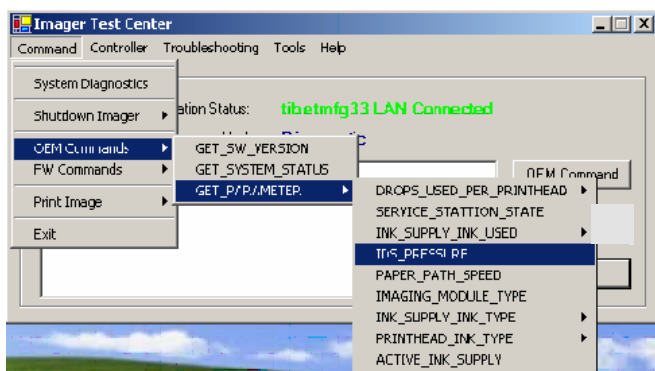
This window will show you the status of the Ink Supply.  
The second number before INK\_SUPPLY is the Ink Supply number.

**Illustration****Description**

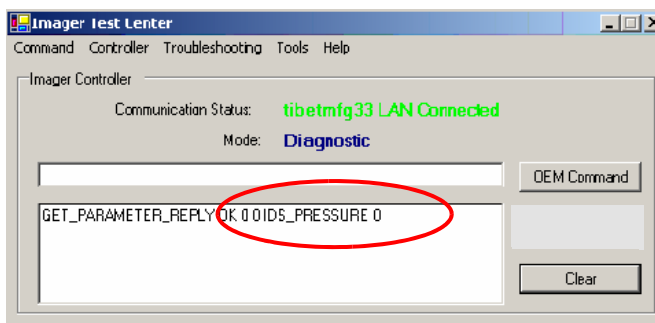
Click Command > OEM Commands > GET\_PARAMETER, and INK\_SUPPLY\_INK\_USED, and select Supply 1.



This window will show you the status of the Ink Supply.  
The second number before INK\_SUPPLY is the Ink Supply number.



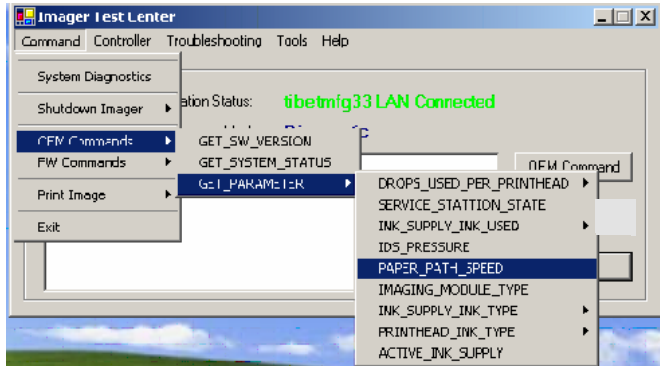
Click on Command > OEM Commands > GET\_PARAMETER, and IDS\_PRESSURE.



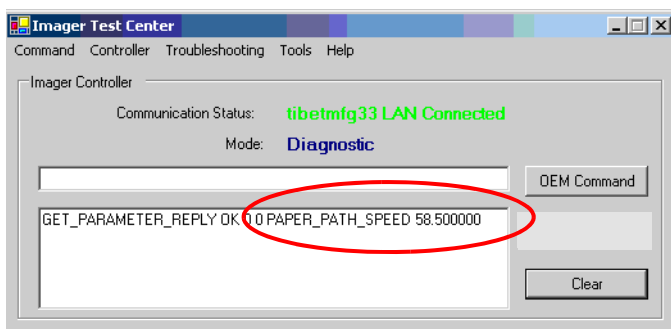
This window will show the status of the IDS Pressure.

## Illustration

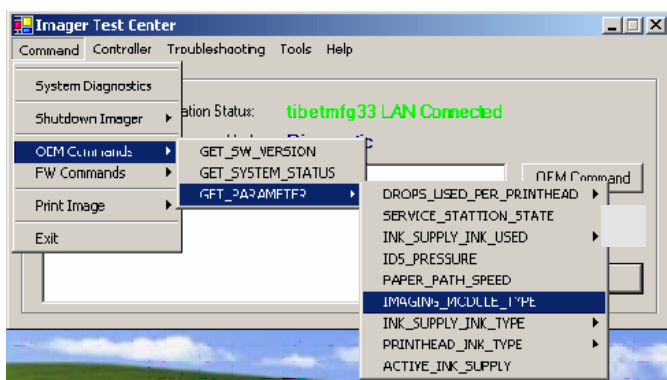
## Description



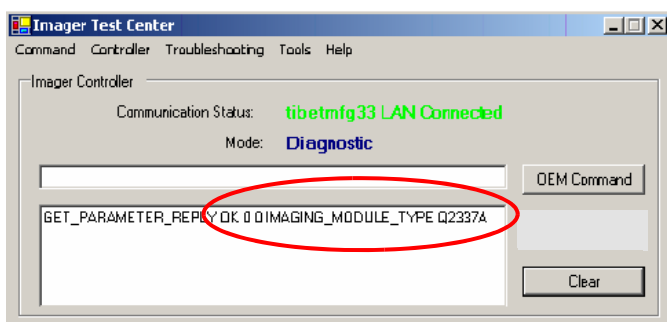
Click on Command > OEM Commands > GET\_PARAMETER, and PAPER\_PATH\_SPEED.



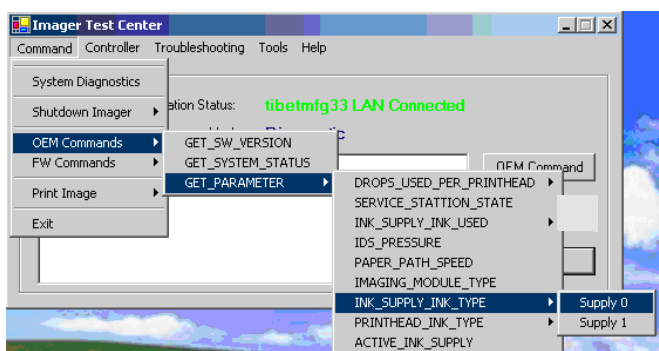
This window will show the paper path speed.



Click Command > OEM Commands > GET\_PARAMETER, and IMAGING\_MODULE\_TYPE.

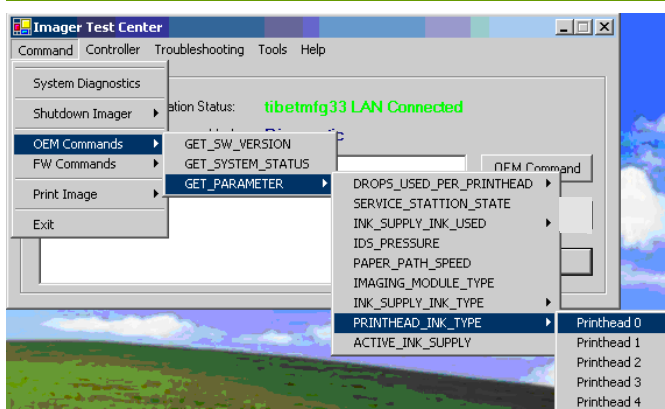
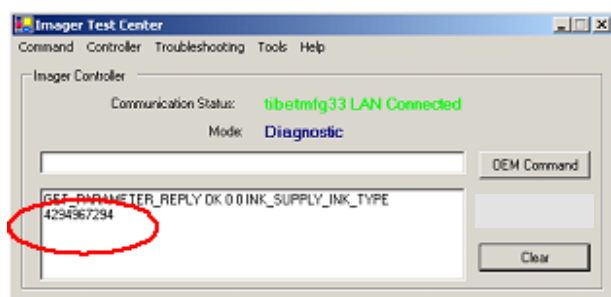


This window will show you the part number for the Imager.

**Illustration****Description**

Click on Command > OEM Commands > GET\_PARAMETER, and INK\_SUPPLY\_INK\_TYPE, and select Supply.

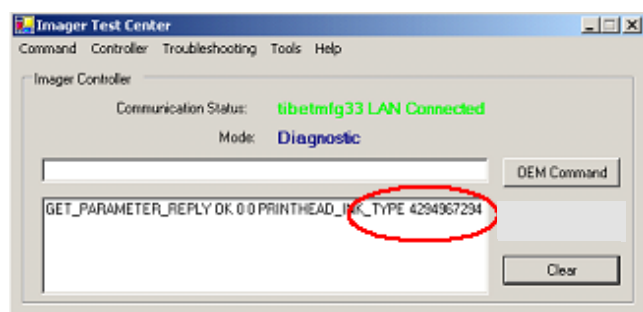
This window will show you the supply number.

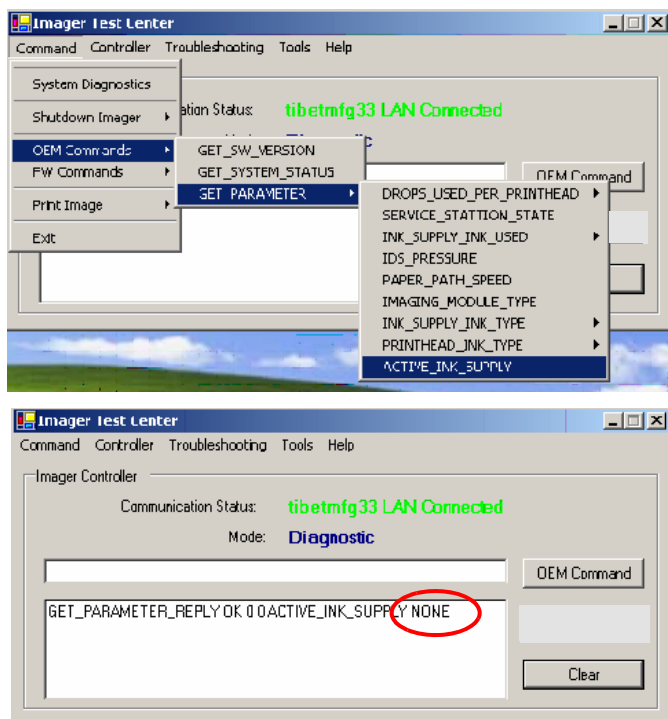


Click on Command > OEM Commands > GET\_PARAMETER, and PRINTHEAD\_INK\_TYPE, and select a printhead.

This window will show the ink type of the printhead.

The second number before PRINTHEAD is the printhead number.



**Illustration****Description**

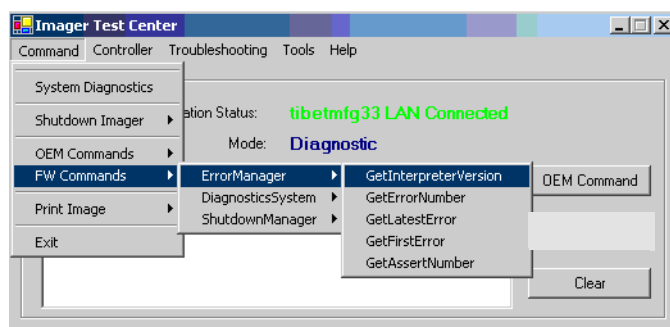
Click on Command > OEM Commands > GET\_PARAMETER, and ACTIVE\_INK\_SUPPLY. Status shows NONE.



# FW Commands

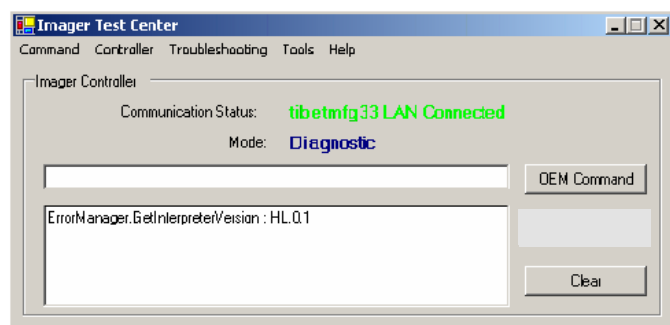
## Illustration

## Description

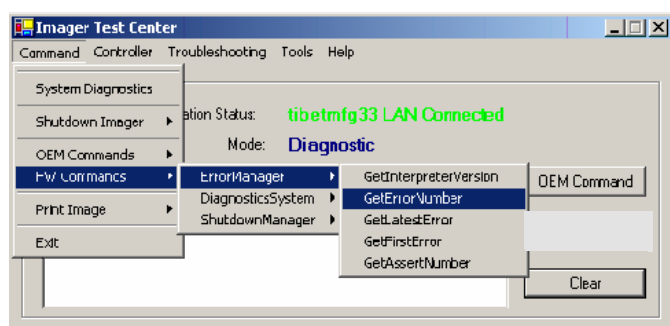


## Error Manager

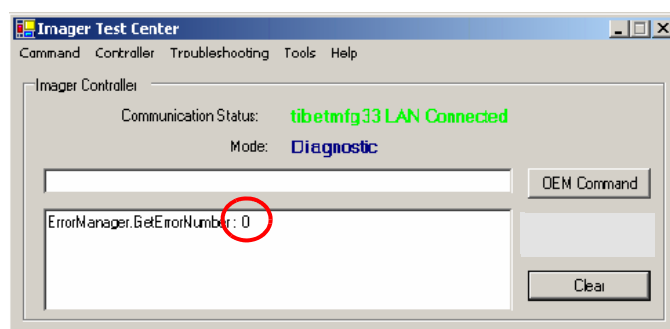
Click on Command > FW Commands > ErrorManager, and then GetInterpreterVersion.



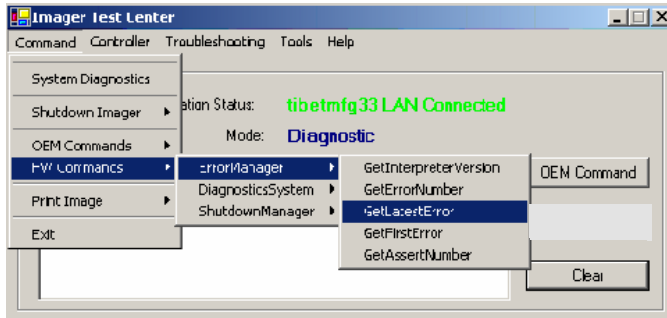
This window shows version: HL.0.1



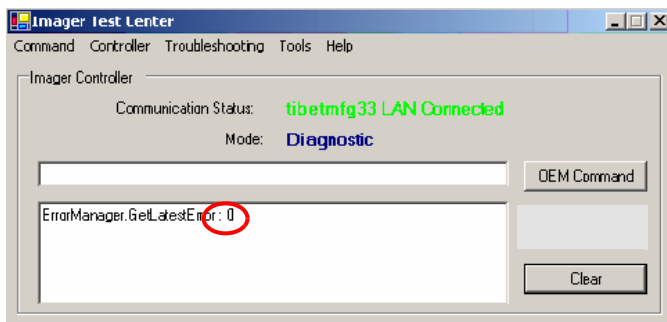
Click on Command > FW Commands > ErrorManager, and then GetErrorNumber.



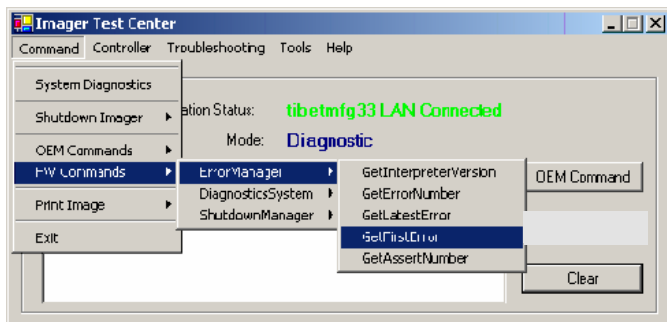
This window shows a value of 0 for GetErrorNumber.

**Illustration****Description**

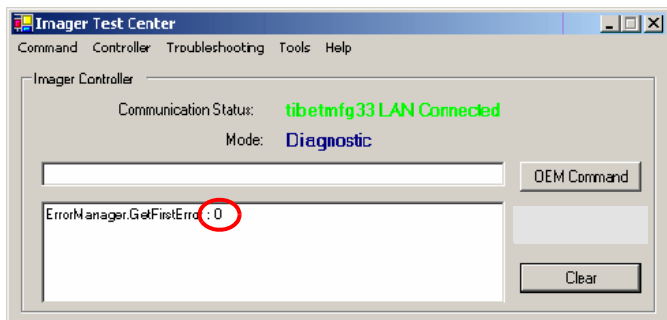
Click on FW Commands > ErrorManager, and then GetLatestError.



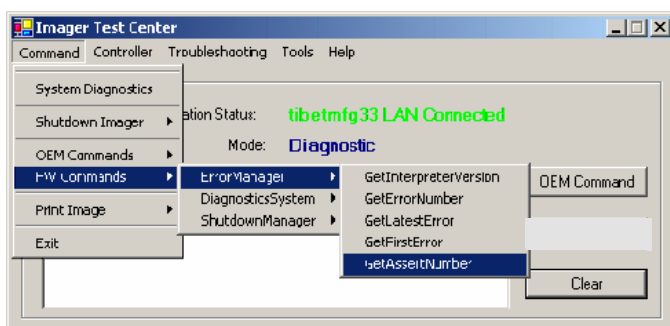
This window shows a value of 0 for GetLatestError.



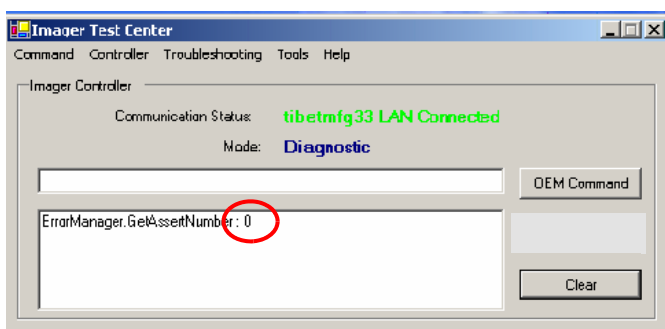
Click on Command > FW Commands > ErrorManager, and then GetFirstError.



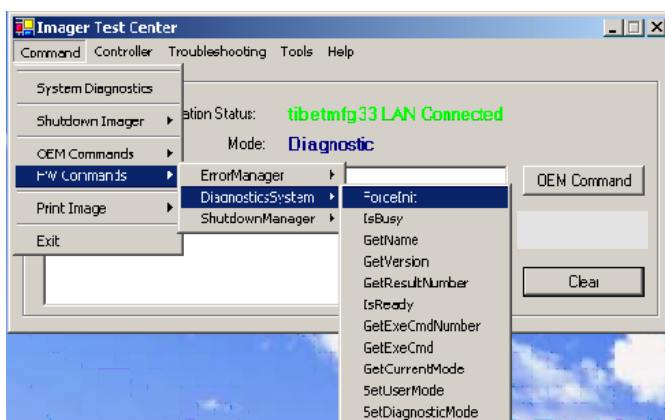
The window shows a value of 0 for GetFirstError.

**Illustration****Description**

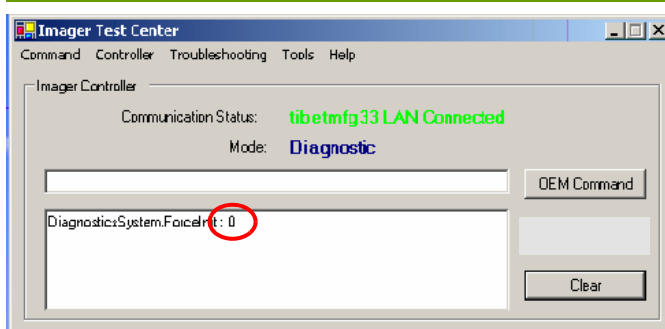
Click on Command > FW Commands > ErrorManager, and then GetAssertNumber.



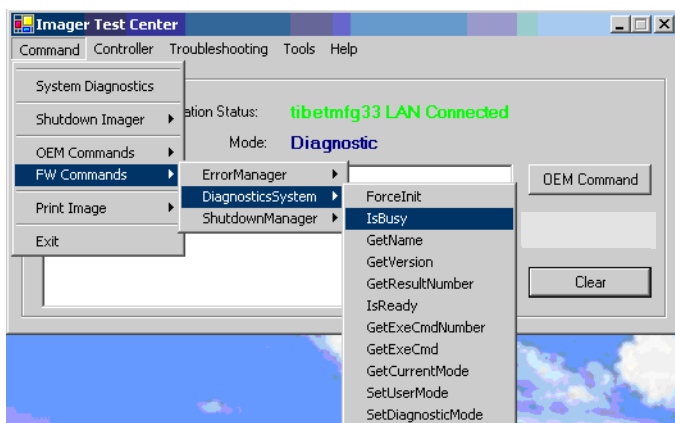
This window shows a value of 0 for GetAssertNumber.

**Diagnostic System**

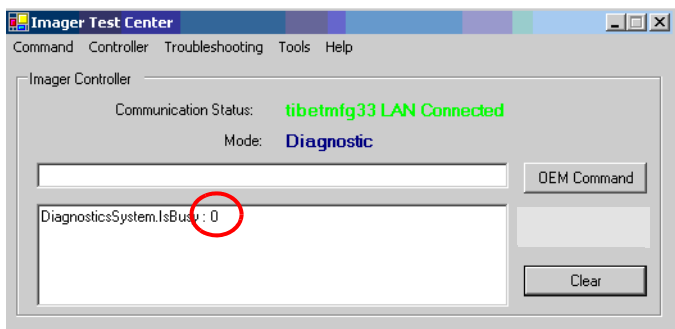
Click on Command > FW Commands > DiagnosticSystem, and then ForceInit.



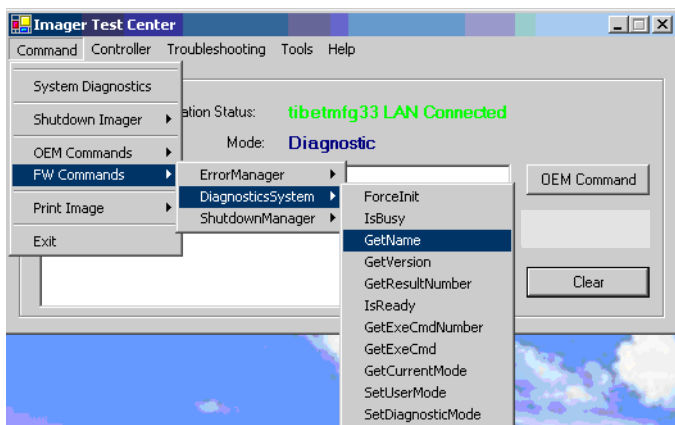
This window shows a value of 0 for ForceInit.

**Illustration****Description**

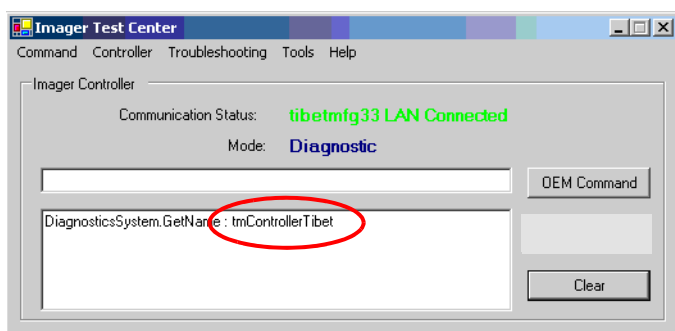
Click on the Command menu and navigate to FW Commands > DiagnosticSystem, and then IsBusy.



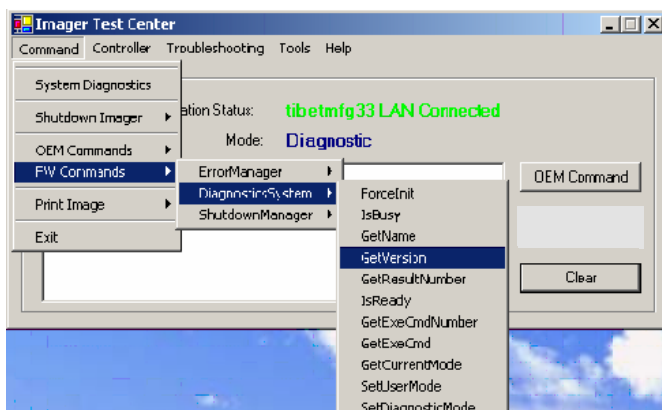
This window shows a value of 0 for IsBusy.



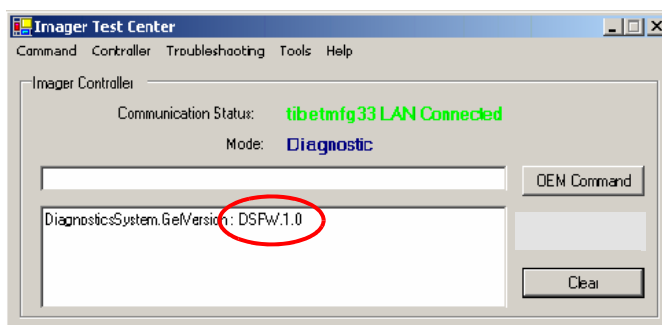
Click on Command > FW Commands > DiagnosticSystem, and then GetName.



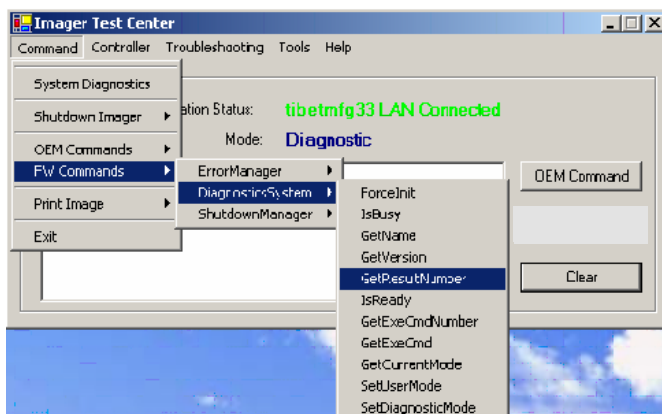
Window shows GetName as tmControllerTibet.

**Illustration****Description**

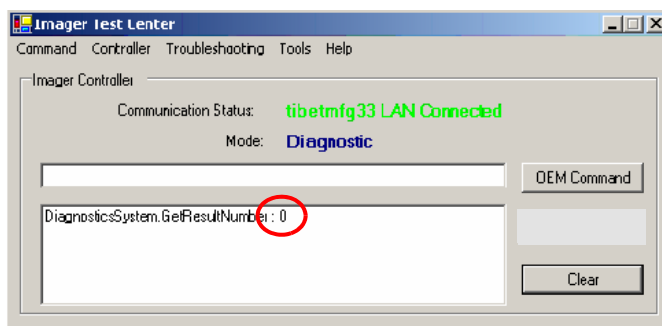
Click on Command > FW Commands > DiagnosticsSystem, and GetVersion.



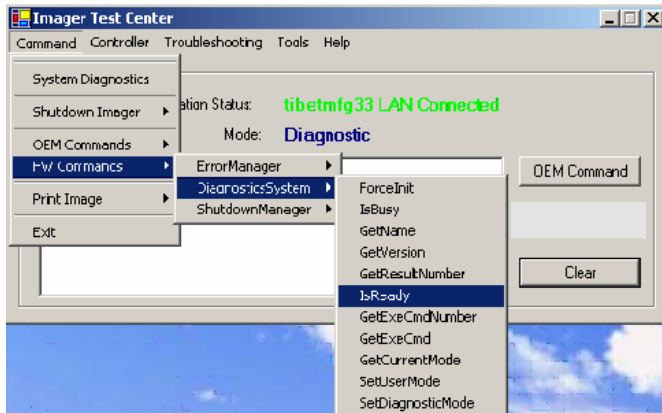
Window shows GetVersion as DSFW.1.0



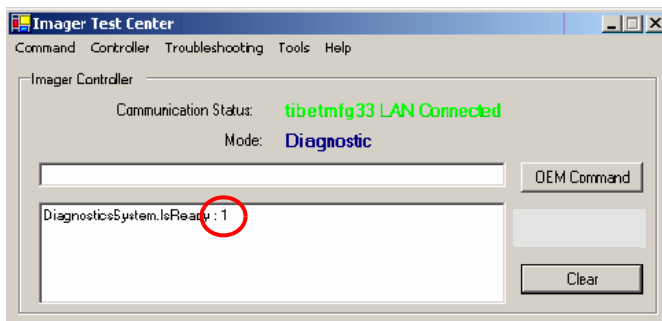
Click on Command > FW Commands > DiagnosticsSystem, and then select GetResultNumber.



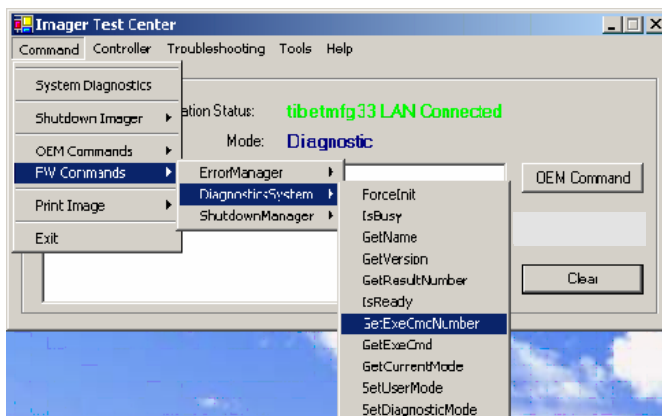
Window shows a value of 0.

**Illustration****Description**

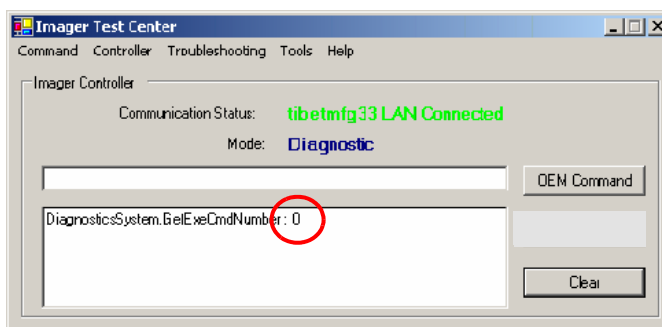
Click on Command > FW Commands > DiagnosticsSystem, and IsReady.



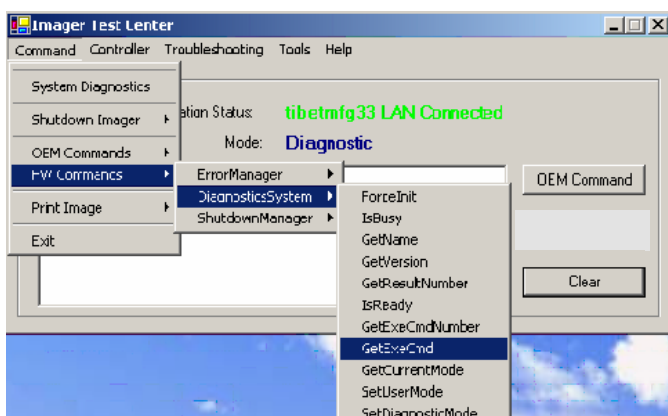
Window shows a value of 1 for IsReady.



Click on Command > FW Commands > DiagnosticsSystem, and GetExeCmdNumber.

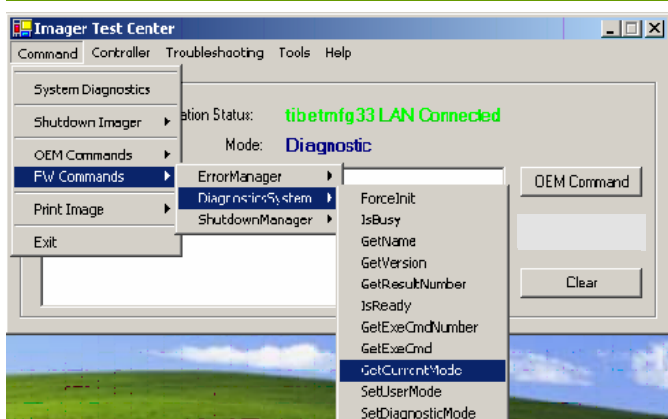


Window shows a value of 0 for GetExeCmdNumber.

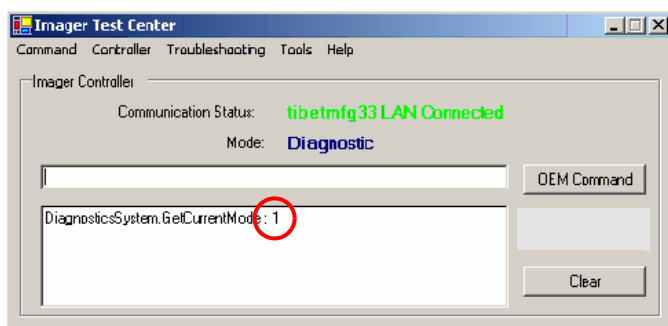
**Illustration****Description**

Click on Command > FW Commands > DiagnosticsSystem, and GetExeCmd.

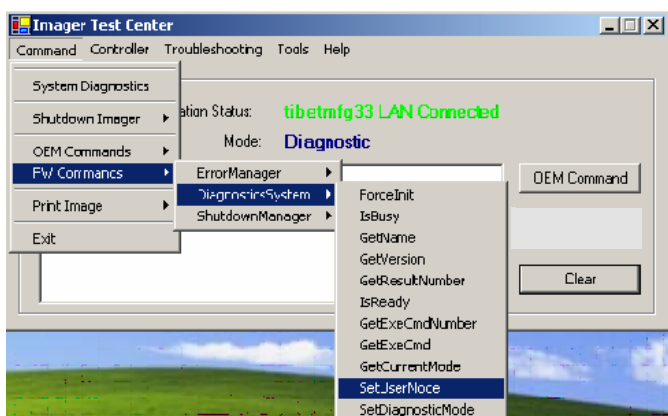
**NOTE:** System freezes up when issuing this command. Have to end task and do a hard boot on the controller.



Click on Command > FW Commands > DiagnosticsSystem, and GetCurrentMode.

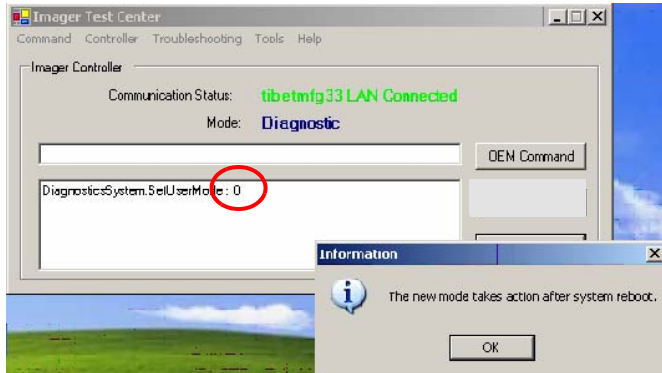


Window shows a value of 1 for GetCurrentMode.



Click Command > FW Commands > DiagnosticsSystem, and SetUserMode.

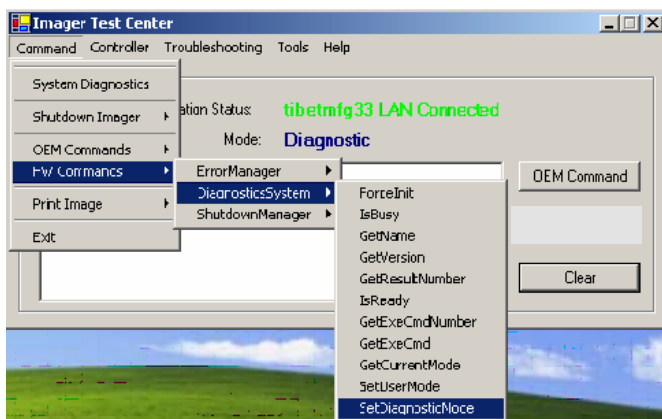
## Illustration



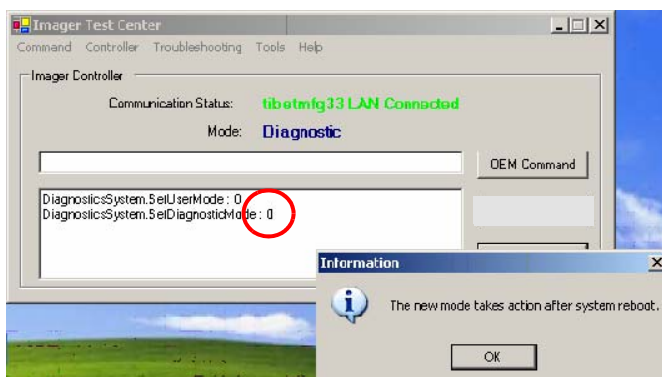
## Description

Window will show a value of 0 for SetUserMode.

**NOTE:** Technician must reboot the system in order for the new mode to function.



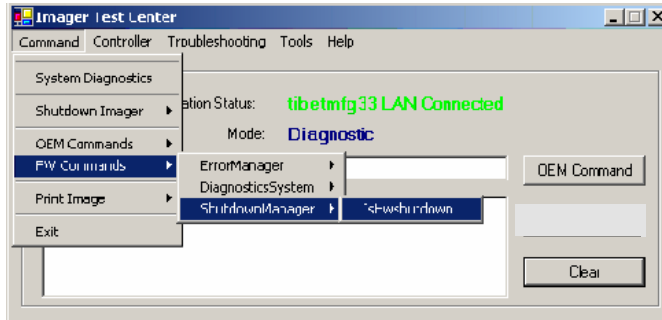
Click on Command > FW Commands > DiagnosticsSystem, and SetDiagnosticMode.



Window will show a value of 0 for SetDiagnosticMode.

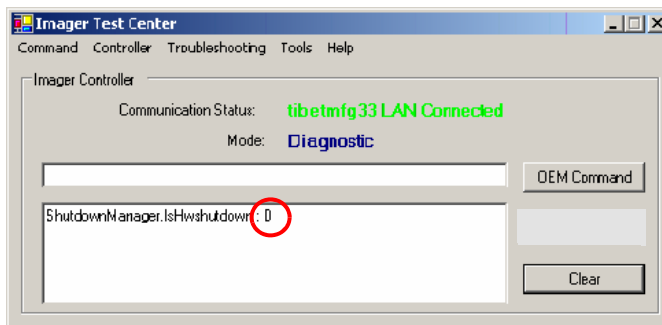
**NOTE:** Technician must reboot the system in order for the new mode to function.



**Illustration****Description**

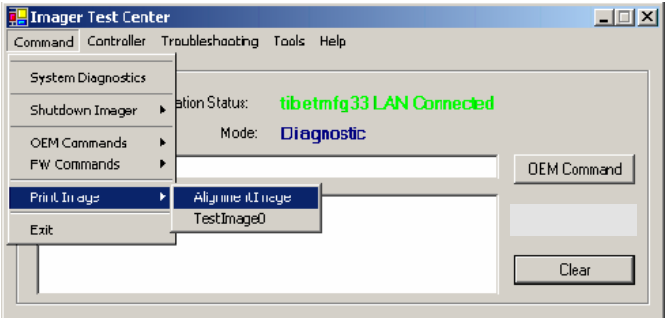
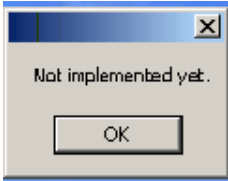
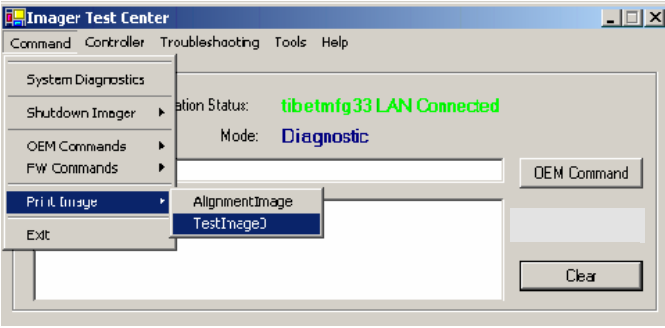
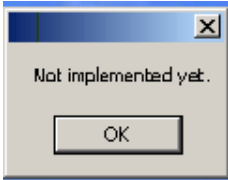
## Shutdown Manager

Click on Command > FW Commands > ShutdownManager, and then IsHwshutdown.



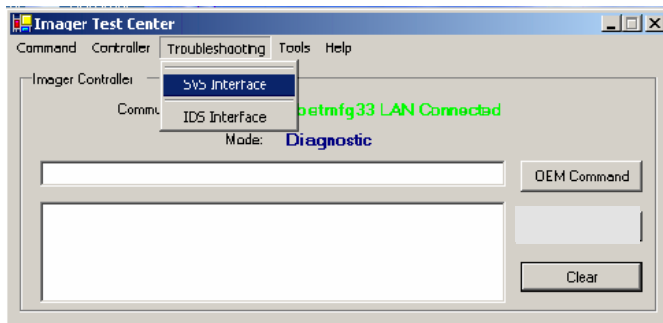
Window shows value of 0 for IsHwshutdown.

# Print Image

Illustration	Description
	<p>Click on Command &gt; Print Image, and AlignmentImage.</p> <p><b>NOTE:</b> This function is not implemented yet and this window pops up.</p> 
	<p>Click on Command &gt; Print Image, and TestImage0.</p> <p><b>NOTE:</b> This function is not implemented yet and this window pops up.</p> 

# Troubleshooting

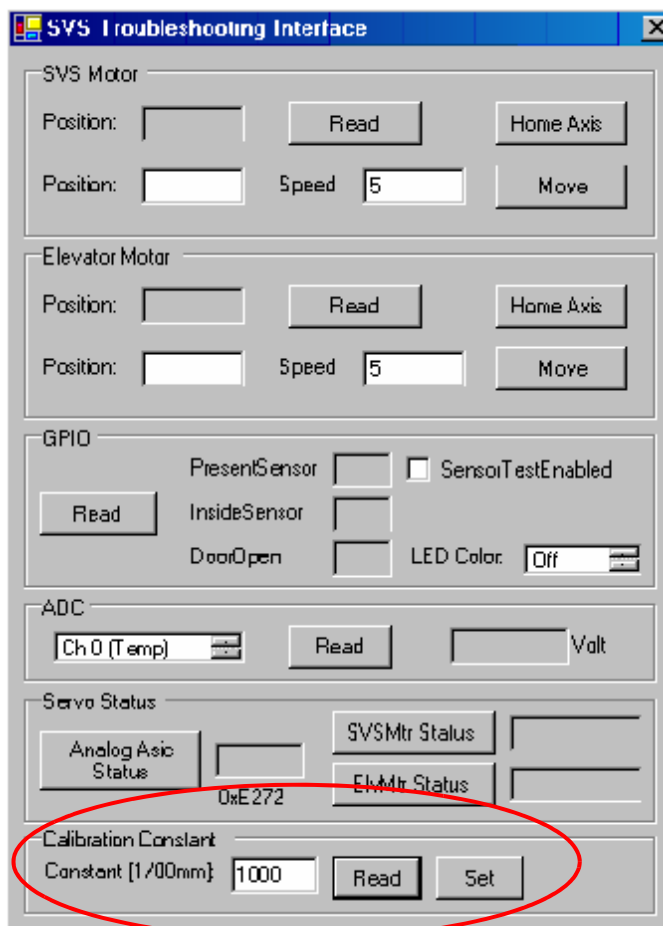
## Illustration



## Description

### SVS Interface

From the Troubleshooting tab select SVS Interface.



This window enables the technician to do a variety of functions, including checking the Calibration Constant.

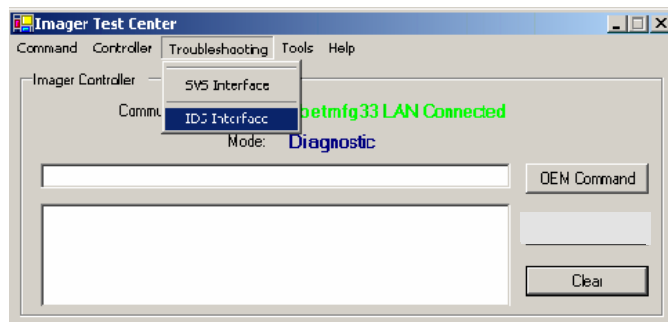
### Calibration Constant

Down at the bottom, click on the **Read** button to check the Calibration Constant.

If the user needs to enter a Constant, enter constant and click on **Set**.

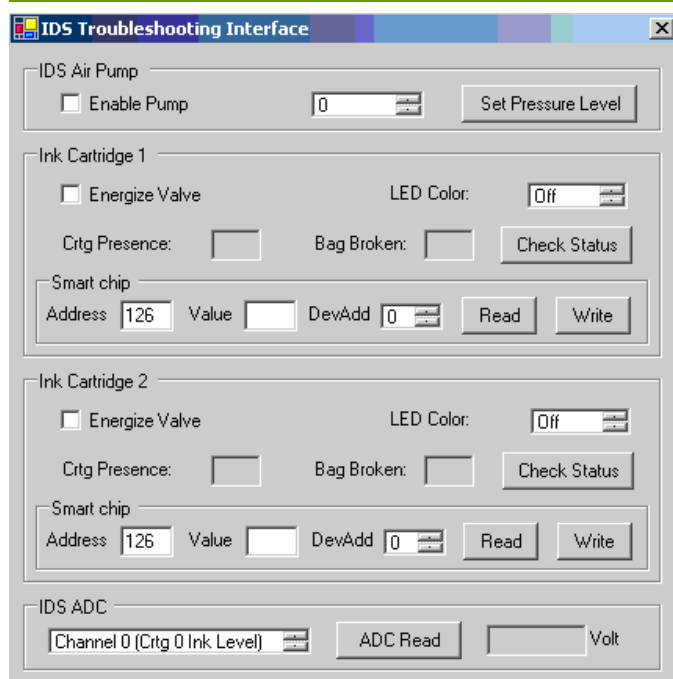
**IMPORTANT:** The unit needs to be rebooted after entering constant.

Exit out of this interface window.

**Illustration****Description**

## IDS Interface

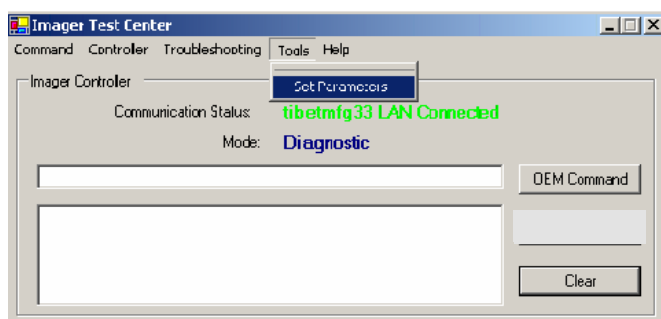
From the Troubleshooting tab select IDS Interface.



This window enables the technician to do a variety of functions.

## Tools and Help

### Illustration

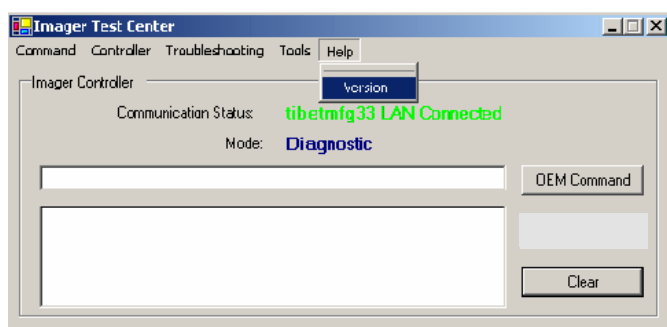
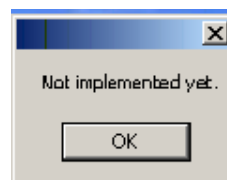


### Description

#### Tools

From the Tools menu select Set Parameters.

**NOTE:** This function is not implemented yet.



#### Help

From the Help menu select Version.

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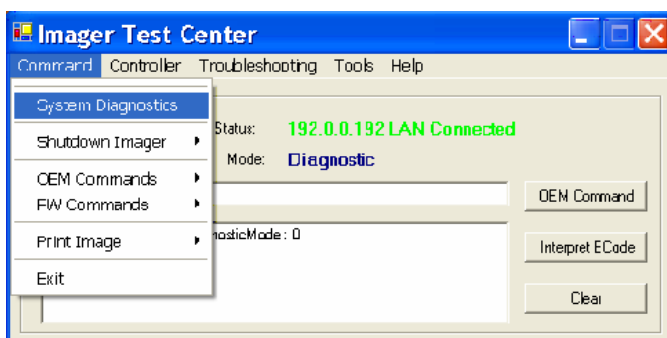
---

## 5 Repair Validation

The following section covers repair validation, using the Imager Test Center Diagnostic tool to verify proper communications between the modules and electronic operation of PCAs. All tests should end with a printout of the HP test pattern; however, during the diagnostic the HP mPrinter 4000 is not connected to the OEM's master controller, which controls the OEM's print platform. Using the HP Java routine, the OEM can print to their printing device, however, the OEM is responsible to monitor print speed control during this operation.

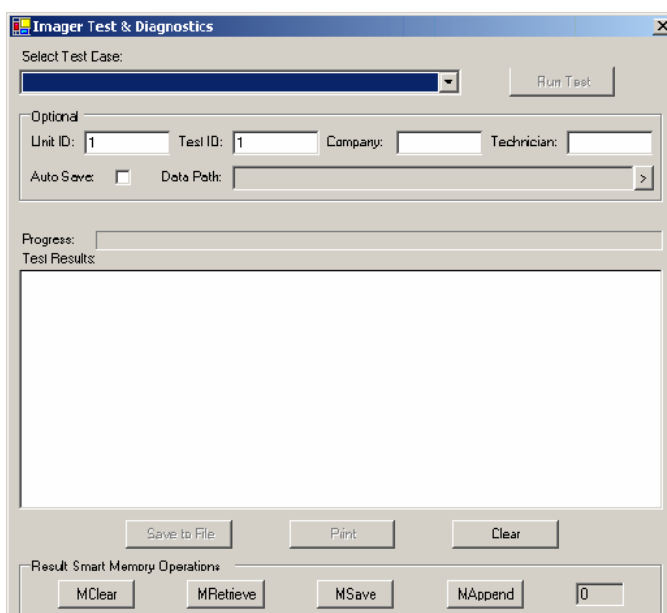
### Illustration

### Description



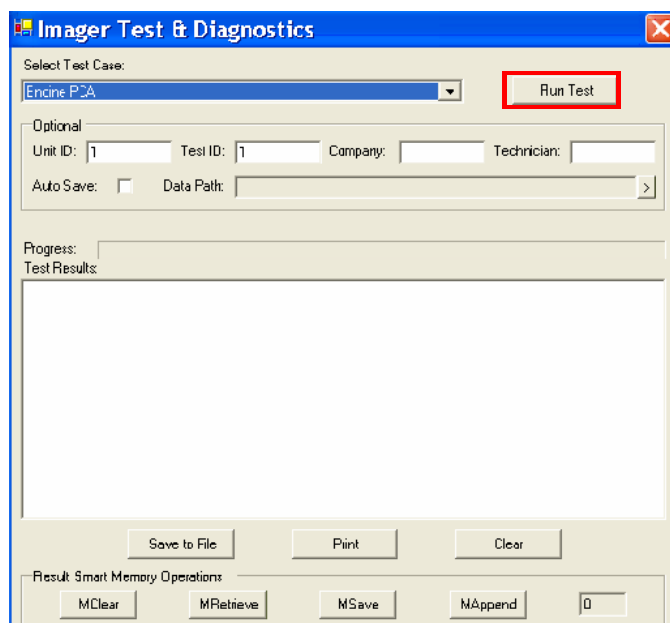
**NOTE:** The HP mPrinter 4000 MUST be rebooted after using any Diagnostics routines, to assure that the HP mPrinter 4000 is set for proper operation.

Click on Command > System Diagnostics.  
See [Imager Test Center User's Guide](#) page 40 to set up in Diagnostic mode.



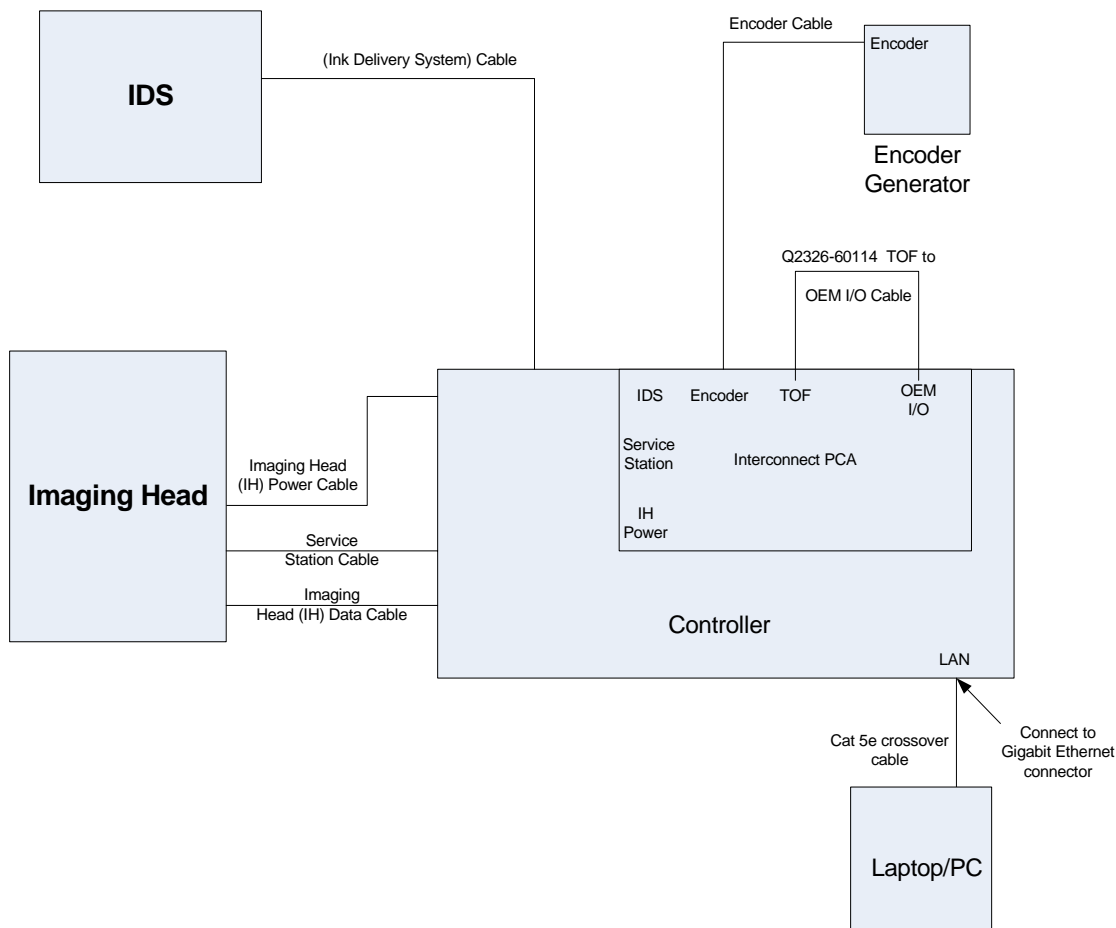
This screen will appear.

Under Select Test Case you will find a list of all the available diagnostic tests.

**Illustration****Description****Engine PCA**

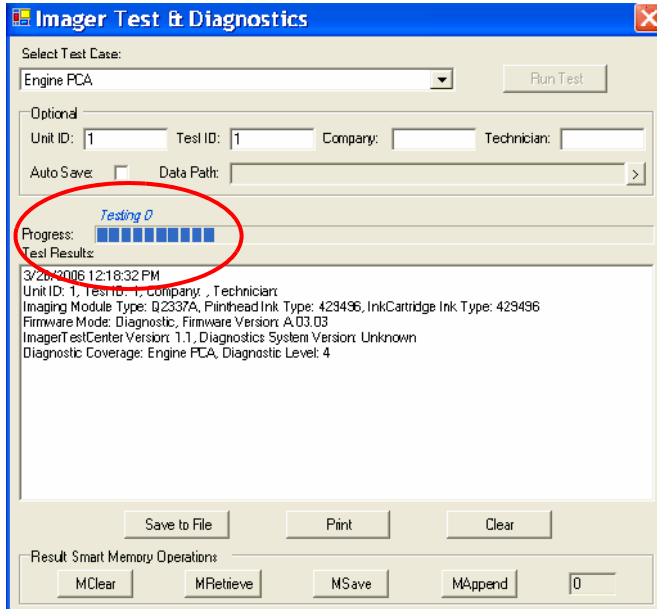
Connect the Encoder Generator Box as shown in the [Setup Schematic](#) (see below).

From the Select Test Case window, click on Engine PCA. Click on the **Run Test** button.

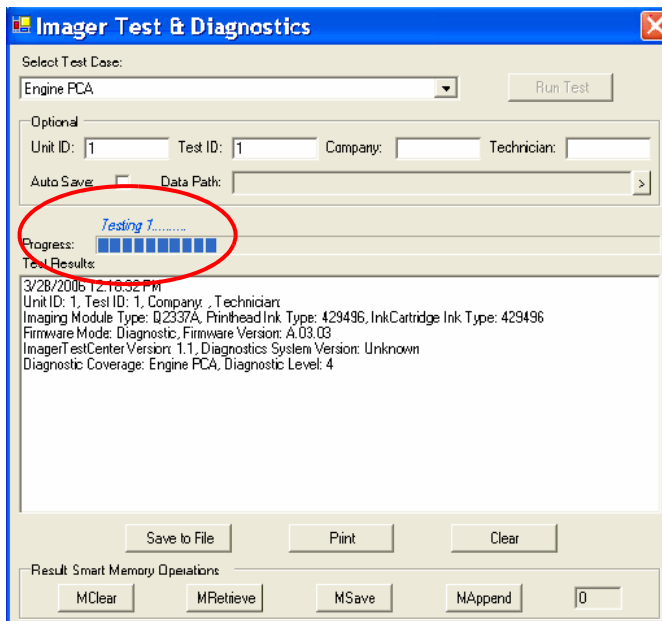


**Figure 5-1** Setup Schematic



**Illustration****Description**

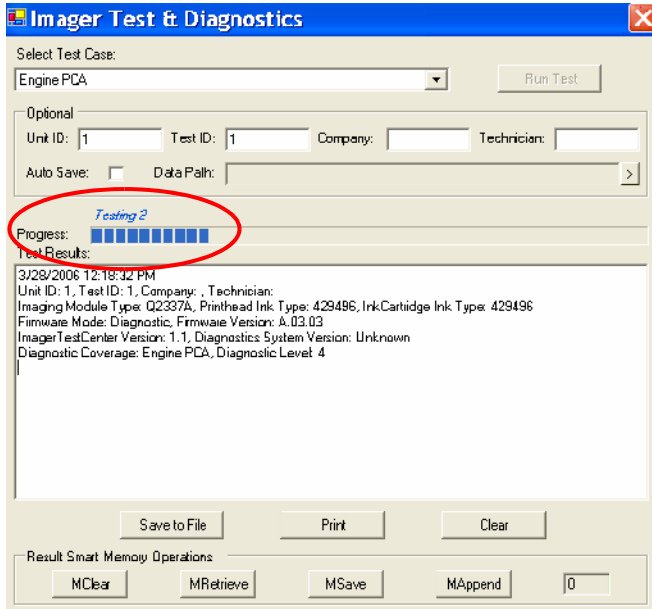
The test will start and show you where it is by displaying Progress.



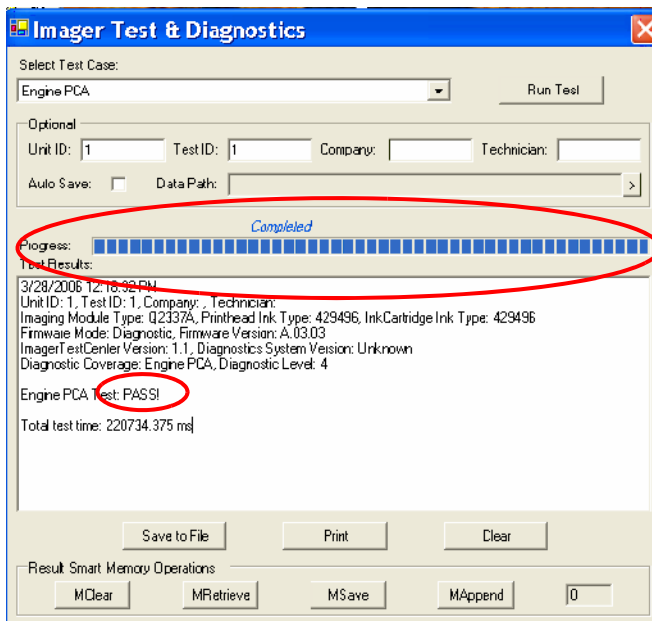
Progress will show Testing 1.

## Illustration

## Description



Progress will show Testing 2.



When test is complete the progress window will say Completed.

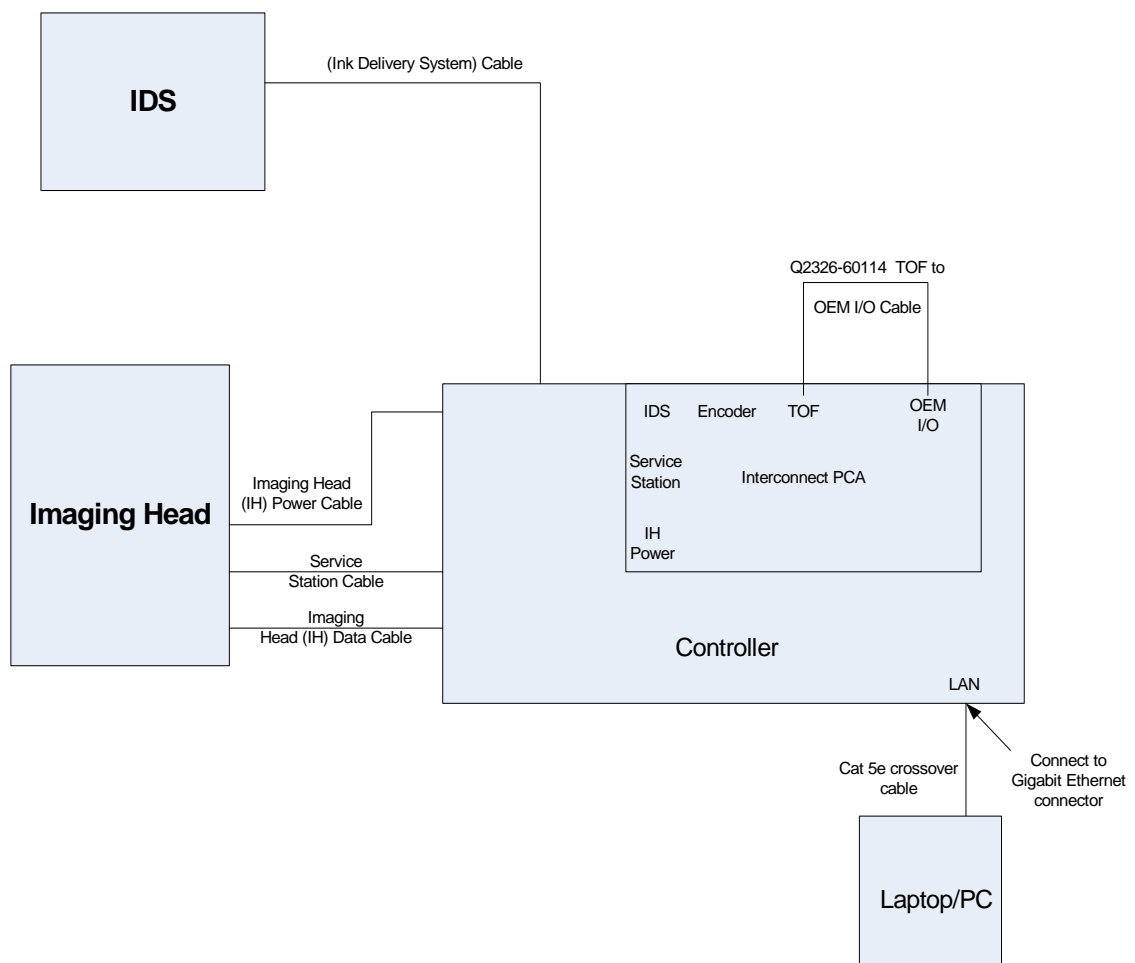
Results show that the Engine PCA Passed.

**Illustration****Description**

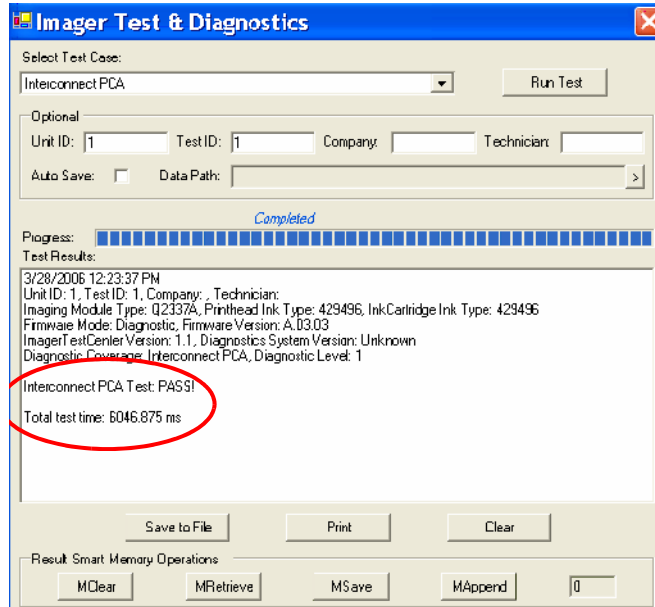
## Interconnect PCA

The Interconnect PCA uses a Q2326-60014 cable on certain occasions during this test; verify the controller software version and model.

Connect the cables as shown below, per the installation's hardware and software versions.

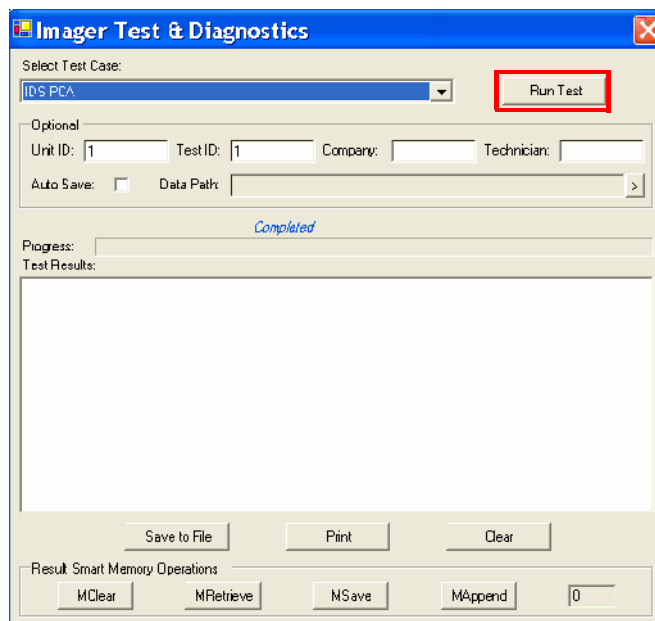


**Figure 5-2** Interconnect PCA Connection Schematic

**Illustration****Description**

When test is complete the progress window will say Completed.

Results show that the Interconnect PCA Passed.

**IDS PCA**

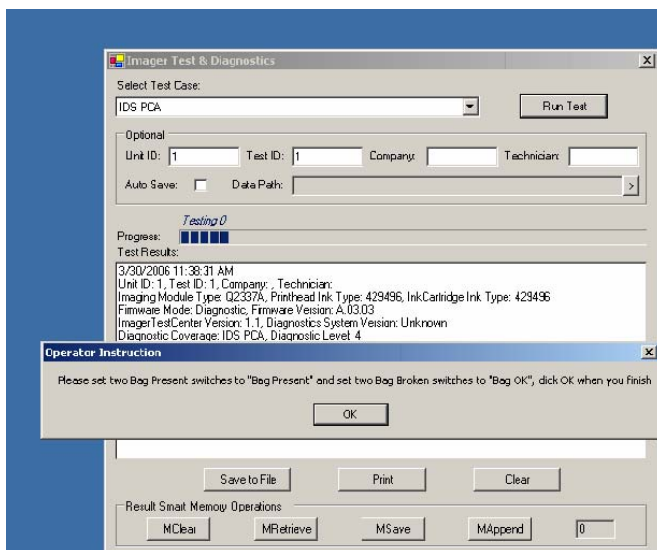
From the Select Test Case window, select IDS PCA.

Click on the **Run Test** button.

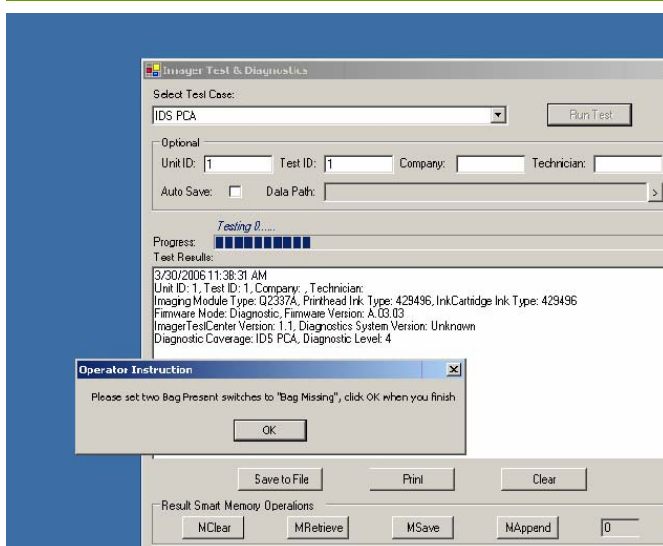
## Illustration

## Description

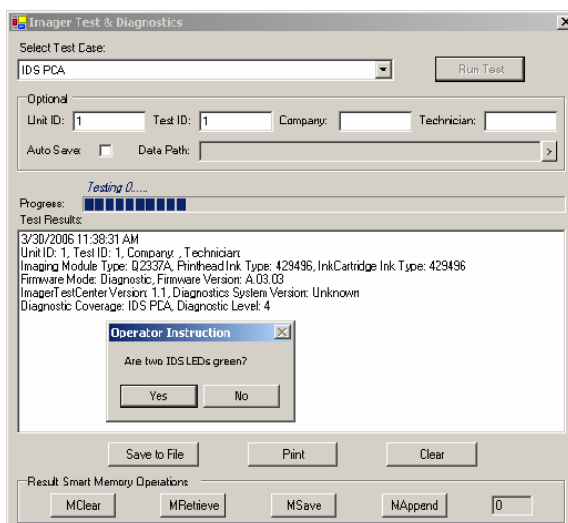
Click **OK** to continue.

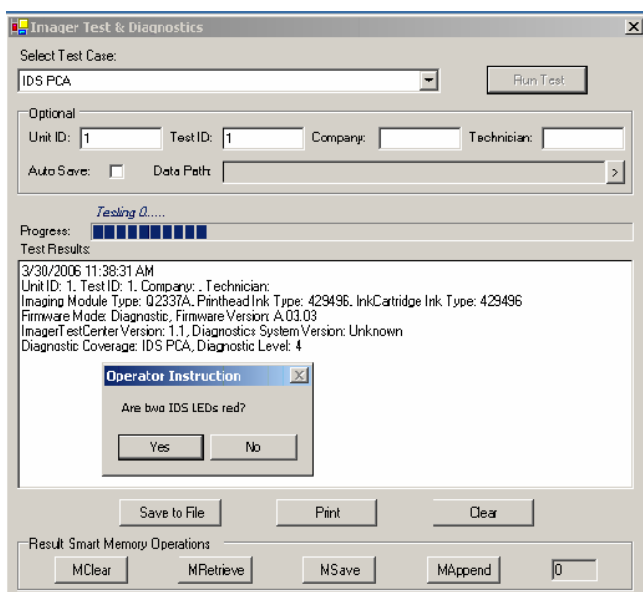


Click **OK** and continue test.

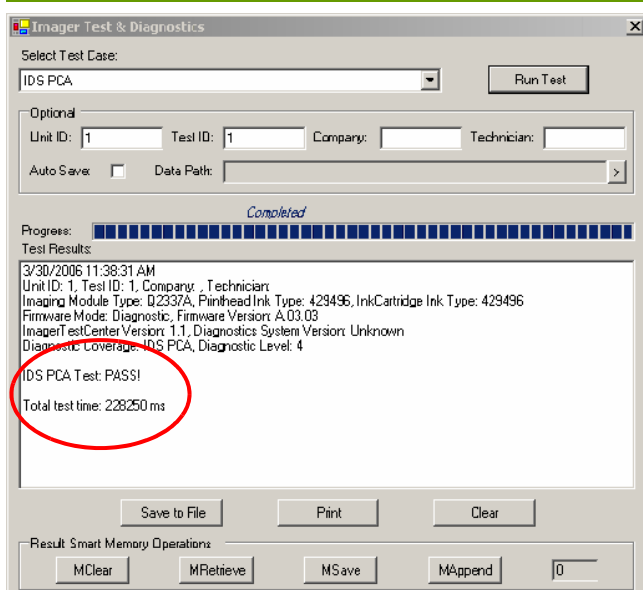


A window will come up and ask the operator if the two IDS LED's are green.  
Click **YES** or **NO**.

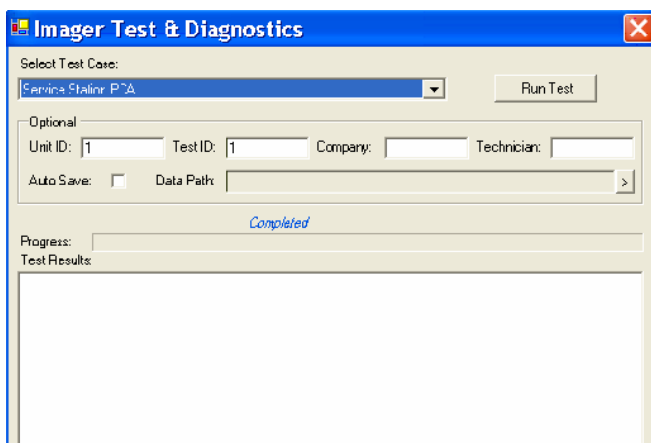


**Illustration****Description**

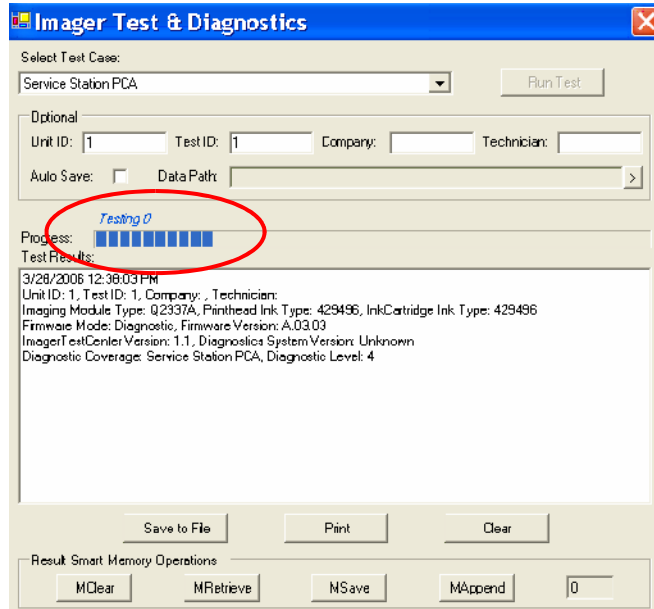
A window will come up and ask the operator if the two IDS LED's are red.  
Click **YES** or **NO**.



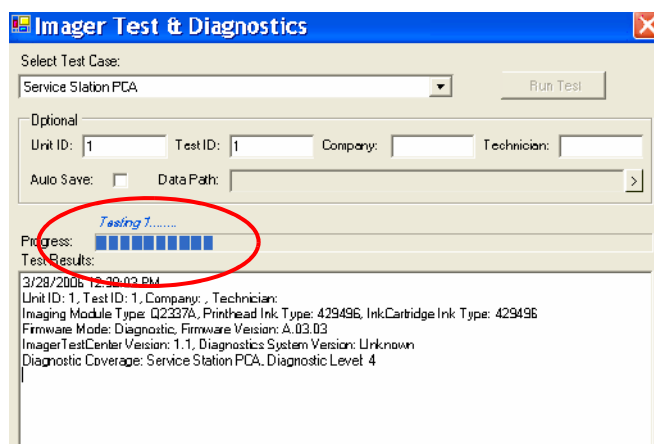
When test is complete the progress window will say Completed.  
Results show that the IDS PCA Passed.

**Service Station PCA**

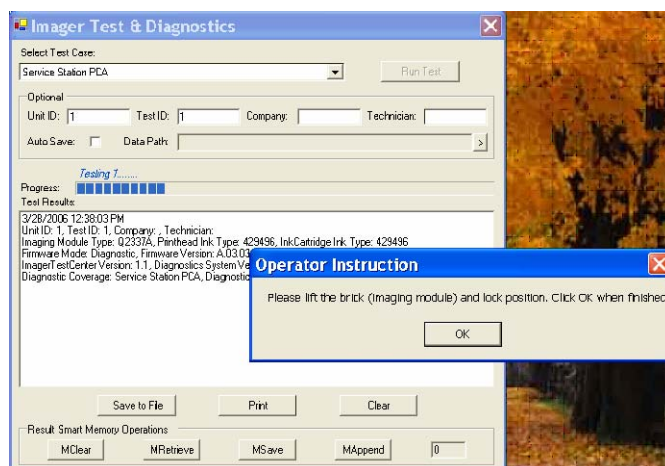
From the Select Test Case window select Service Station PCA.

**Illustration****Description**

Progress will show Testing 0.



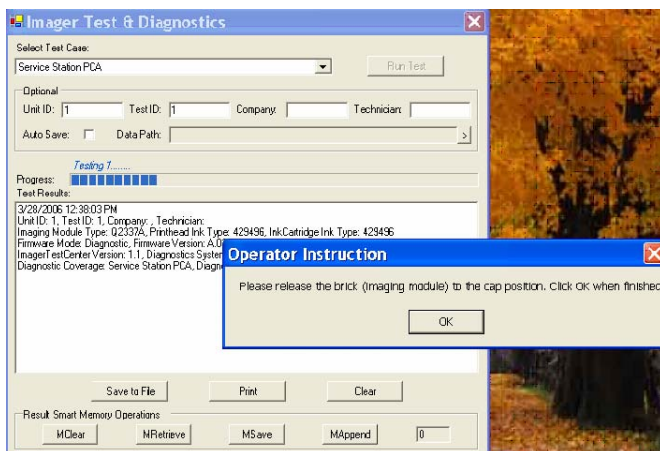
Progress will show Testing 1.



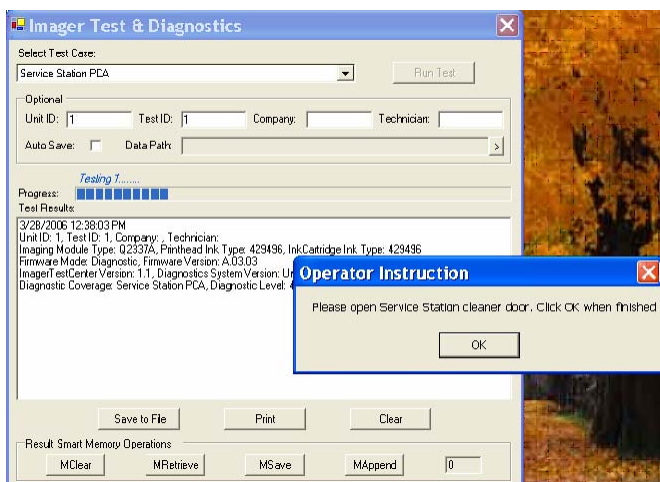
Window will come up saying lift brick, and then click OK.

## Illustration

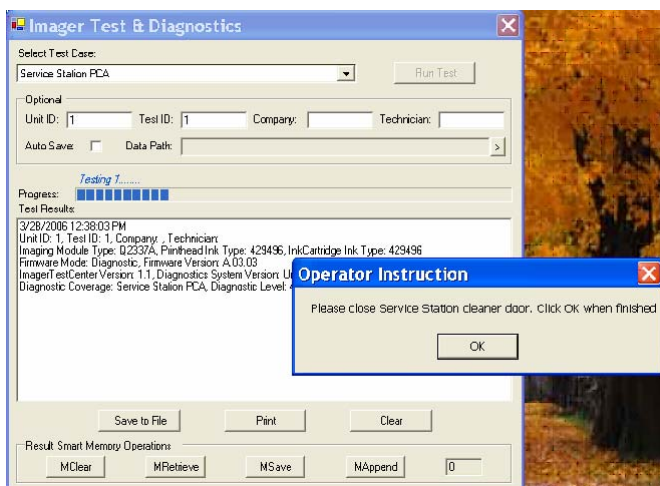
## Description



Window will come up saying release brick, and then click **OK**.

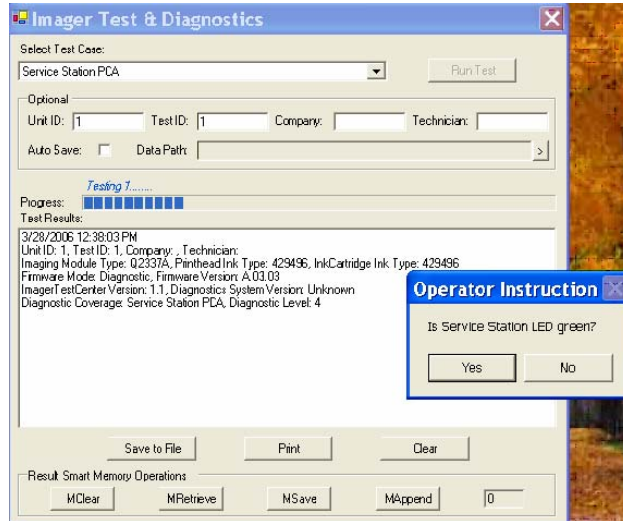


Open Service Station door, then click **OK**.



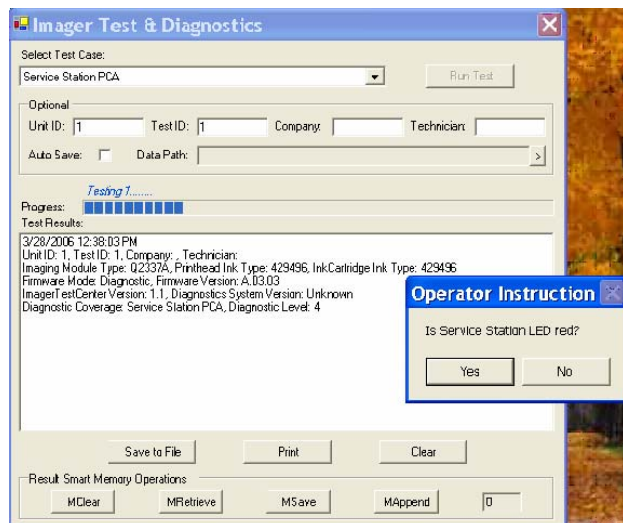
Close Service Station door, then click **OK**.



**Illustration****Description**

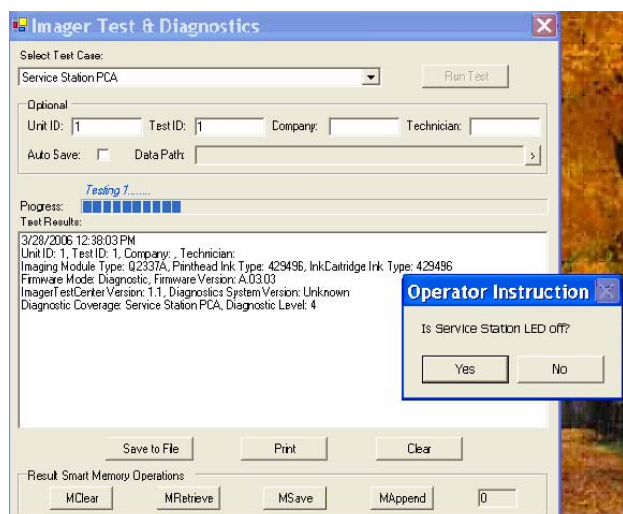
A window will come up and ask the operator "Is Service Station LED green?"

Click **YES** or **NO**.



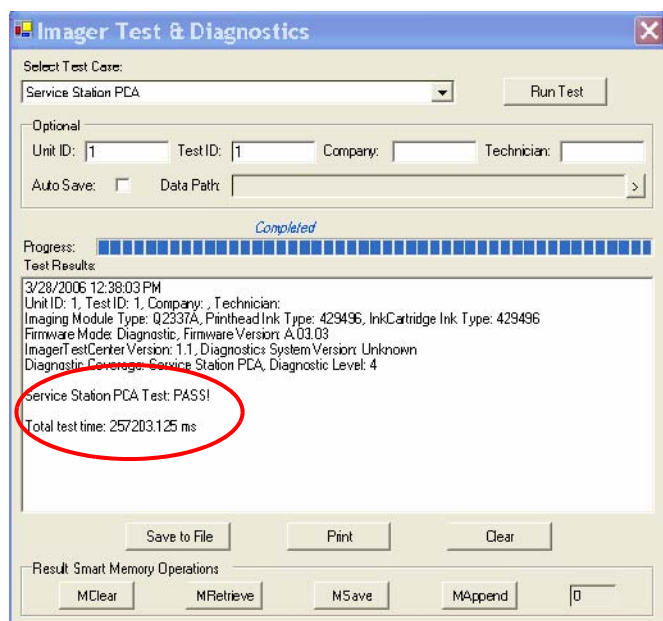
A window will come up and ask the operator "Is Service Station LED red?"

Click **YES** or **NO**.



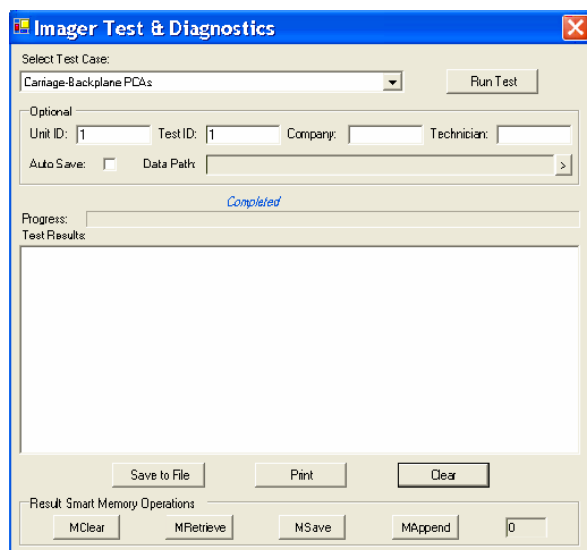
Window will come up and ask the operator "Is Service Station LED off?"

Click **YES** or **NO**.

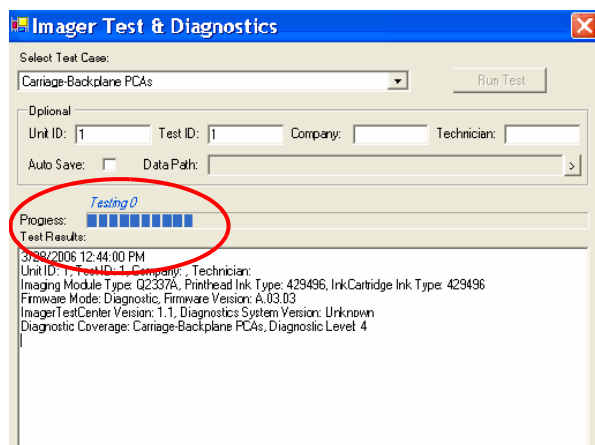
**Illustration****Description**

Progress window will say Completed and the Test Results window will say Pass or Fail.

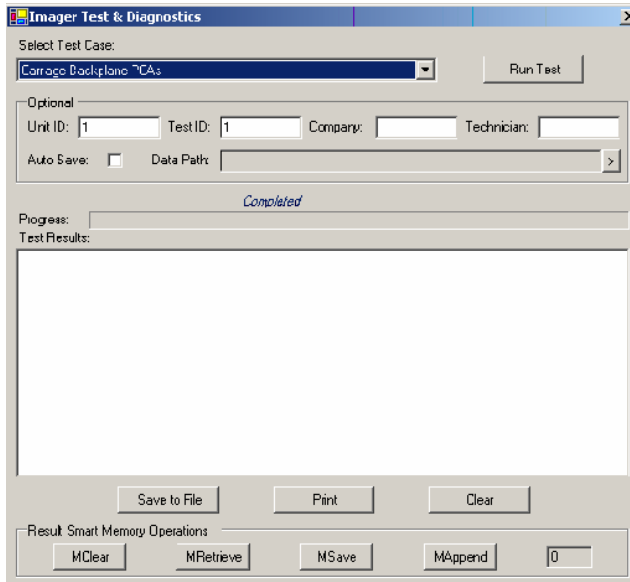
Test Results show Service Station PCA Test Passed.

**Carriage-Backplane PCA**

Under Select Test Case, click on Carriage-Backplane PCAs and then click the **Run Test** button.

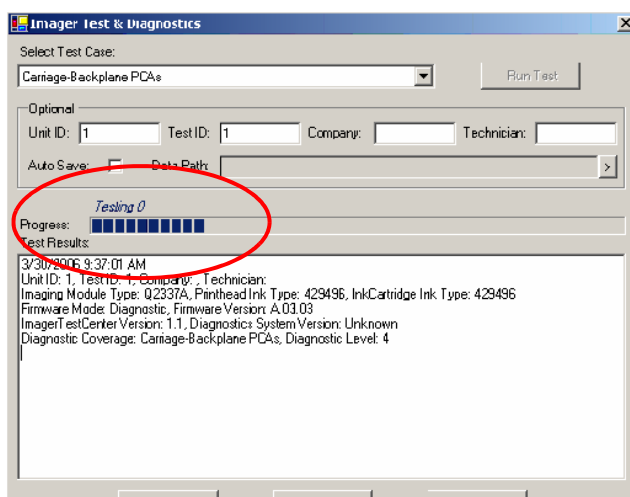


Progress will show Testing 0.

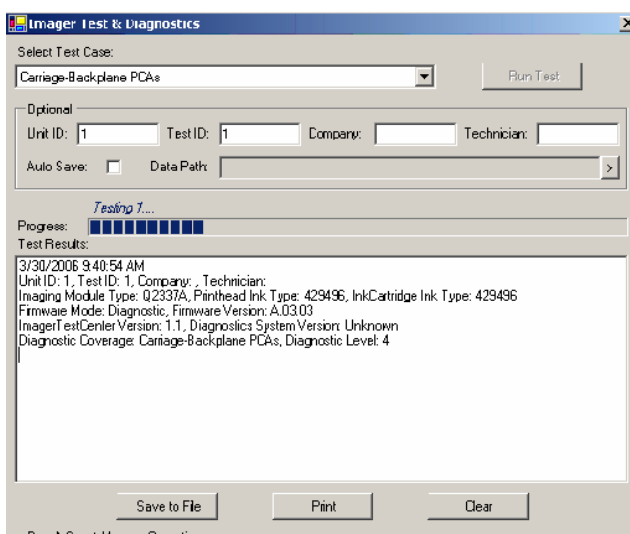
**Illustration****Description**

Rebooted system.

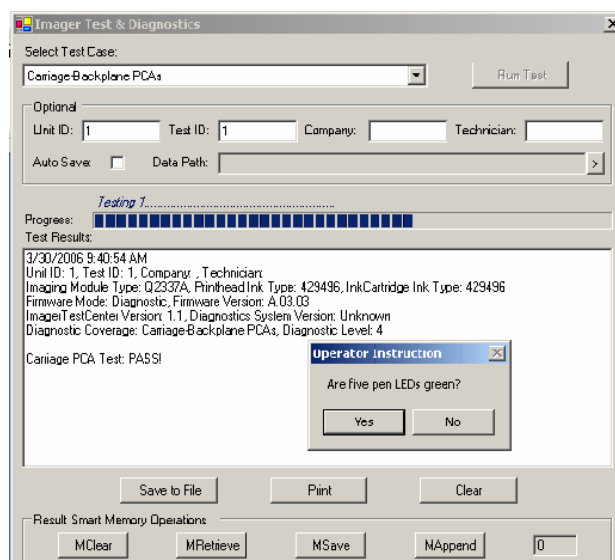
Under Select Test Case, click on Carriage-Backplane PCAs and then click the **Run Test** button.



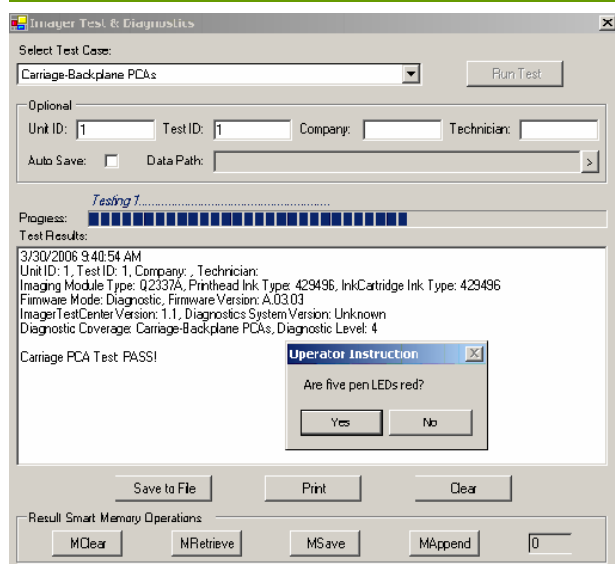
Progress will show Testing 0.



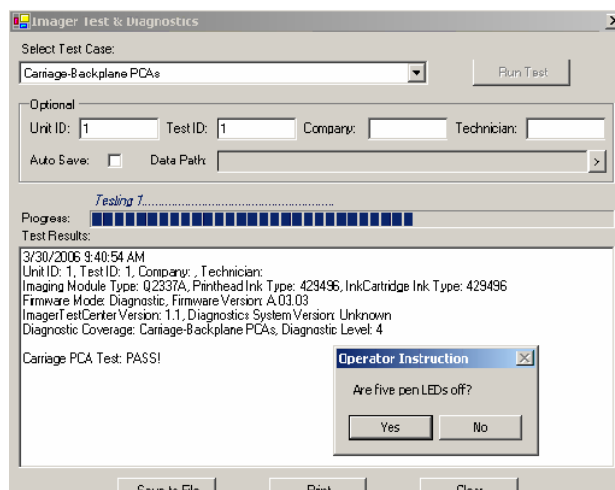
Progress will show Testing 1.

**Illustration****Description**

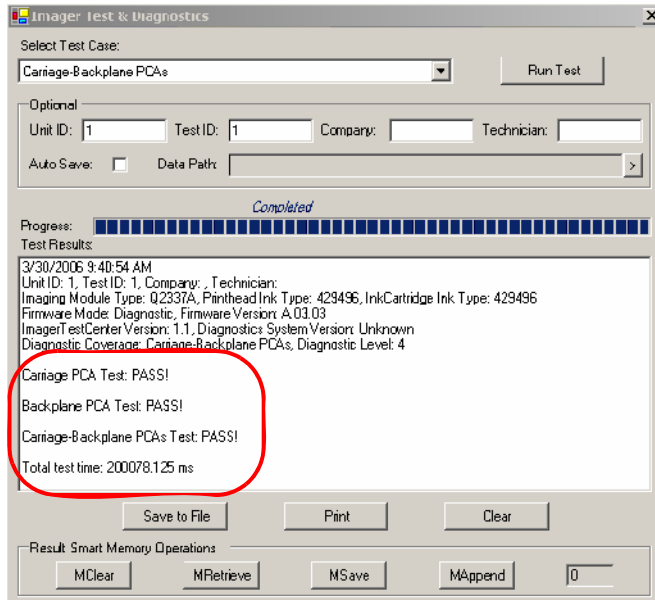
A window will come up and ask the operator if all five pen LED's are green?  
Click **YES** or **NO**.



A window will come up and ask the operator if all five pen LED's are red?  
Click **YES** or **NO**.

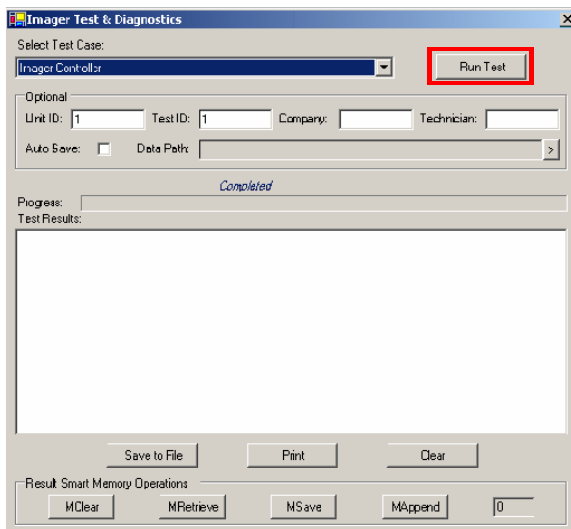


A window will come up and ask the operator if all five pen LED's are off?  
Click **YES** or **NO**.

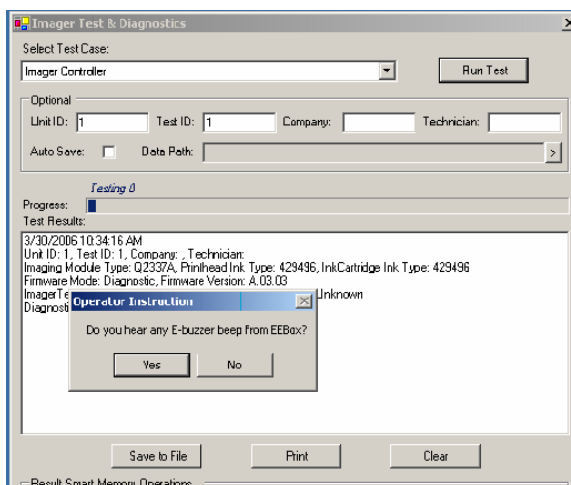
**Illustration****Description**

Progress will show Completed and the Test Results window will show Pass or Fail.

Shows all tests Passed.

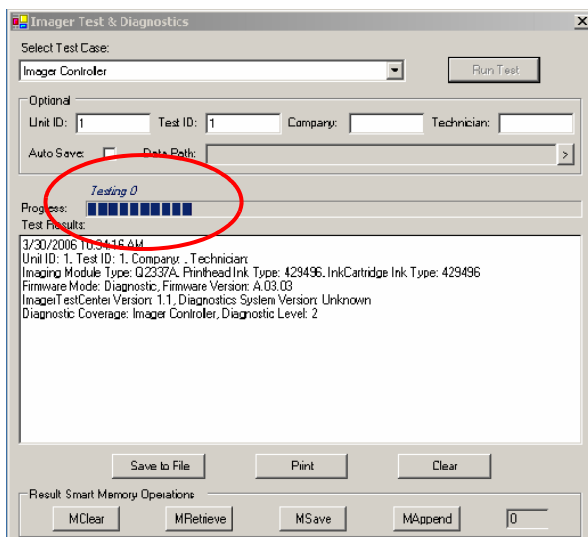
**Imager Controller**

Under Select Test Case, click on Imager Controller and then click the **Run Test** button.

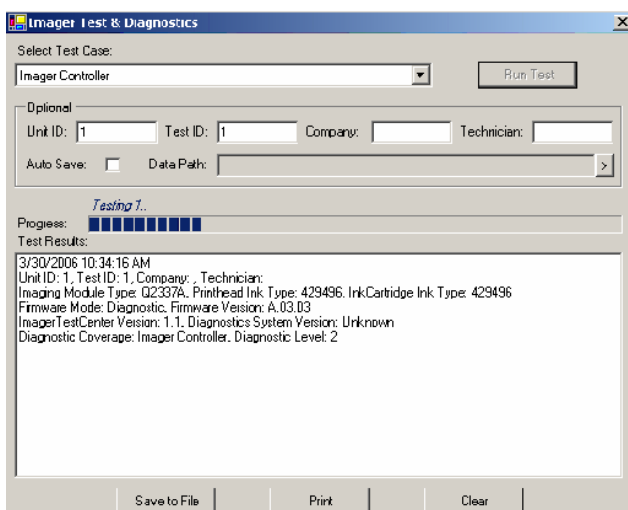


Window will come up asking if you hear an E-buzzer beep?

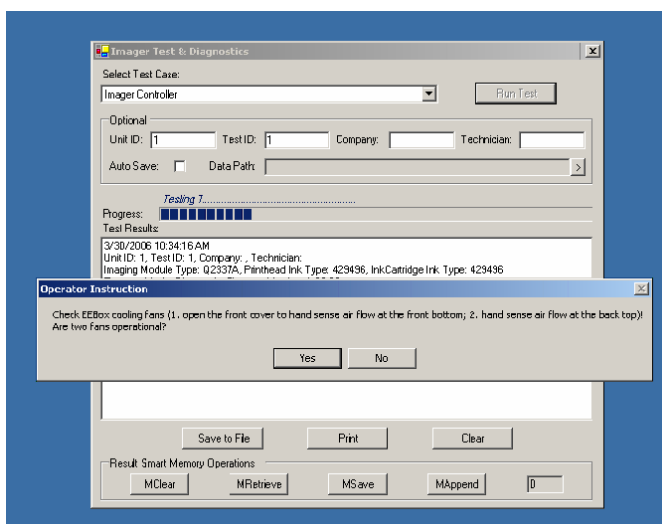
If Yes, unit failed.

**Illustration****Description**

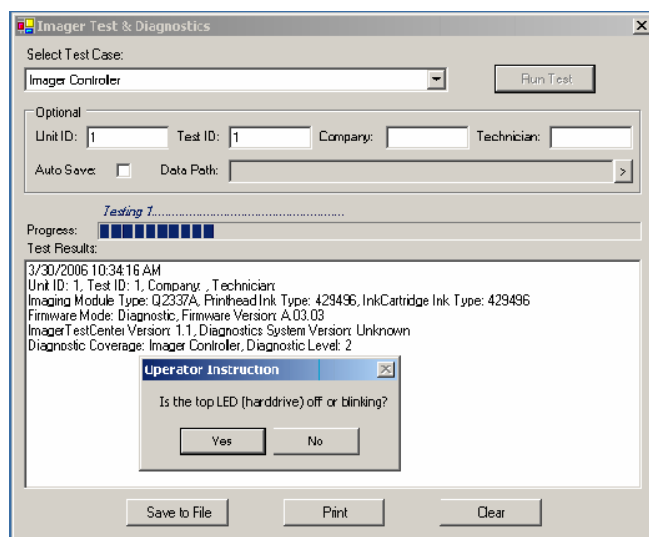
Progress will show Testing 0.



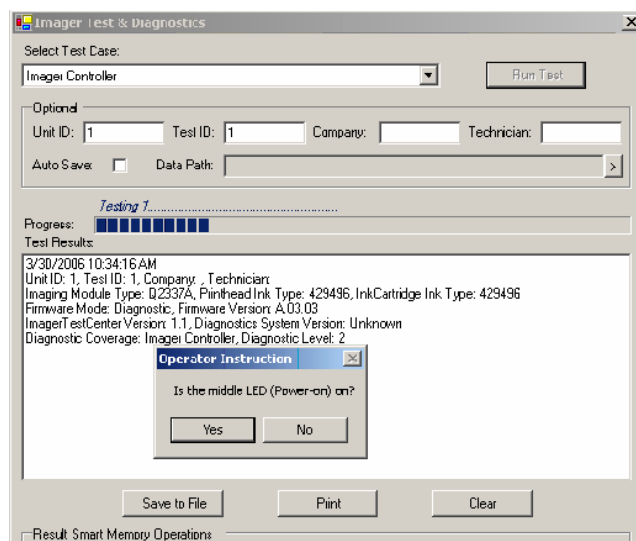
Progress will show Testing 1.



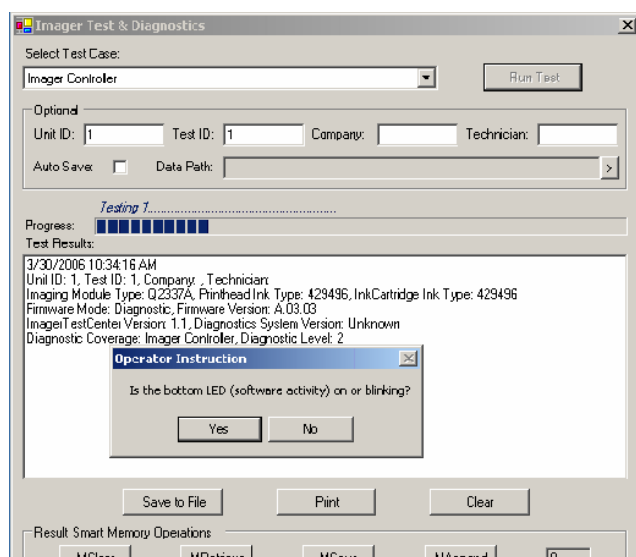
In the front and back of the EE box, check to make sure fans are on.

**Illustration****Description**

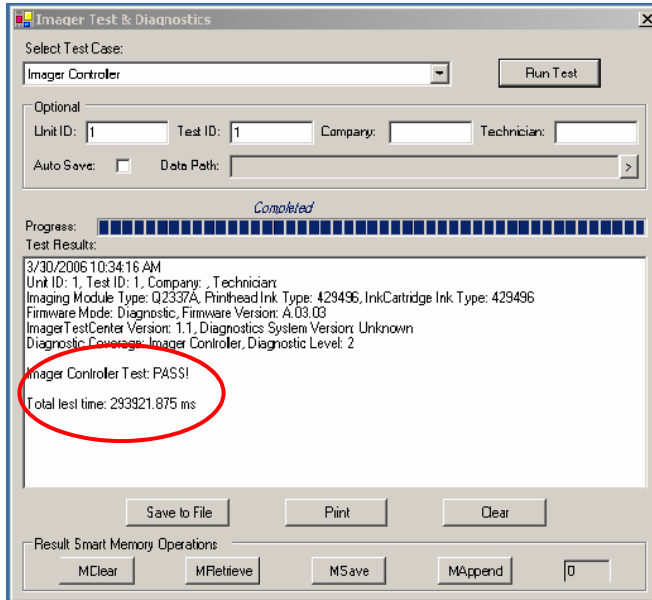
Window comes up saying "Is the top LED (harddrive) off or blinking?"  
Click **Yes** or **No**.



Window comes up saying "Is the middle LED (Power-on) on?"  
Click **Yes** or **No**.

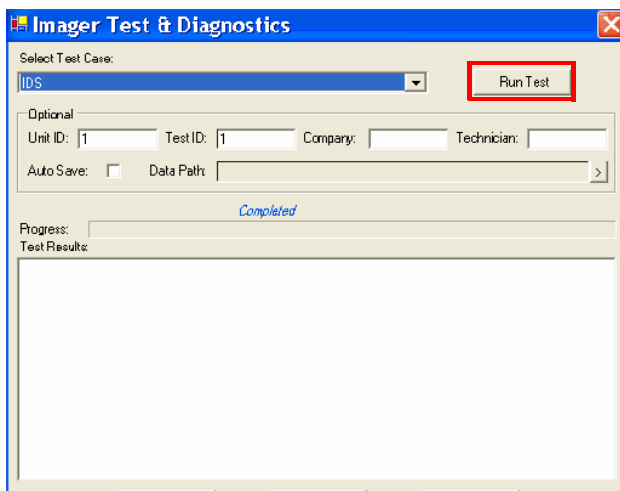


Window pops up saying "Is the bottom LED (software activity) on or blinking?"  
Click **Yes** or **No**.

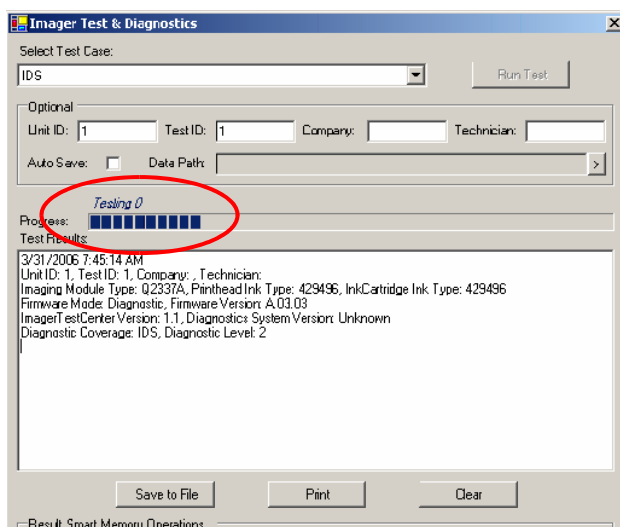
**Illustration****Description**

Progress will show **Completed** and the Test Results window will show **Pass** or **Fail**.

Shows Imager Controller Test Passed.

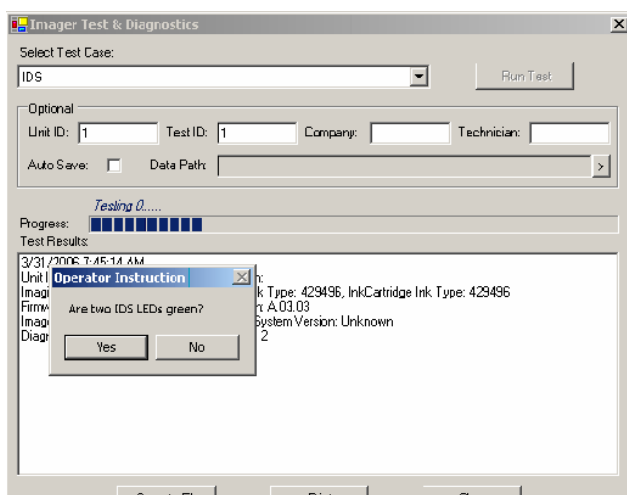
**IDS**

From Select Test Case window click on IDS and click **Run Test**.



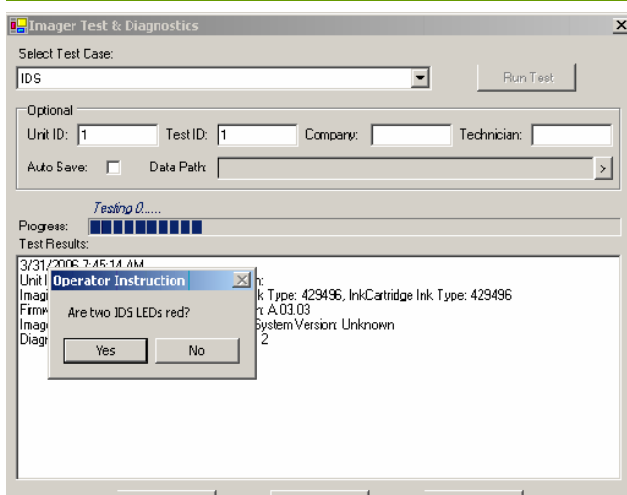
Progress shows **Testing 0**.



**Illustration****Description**

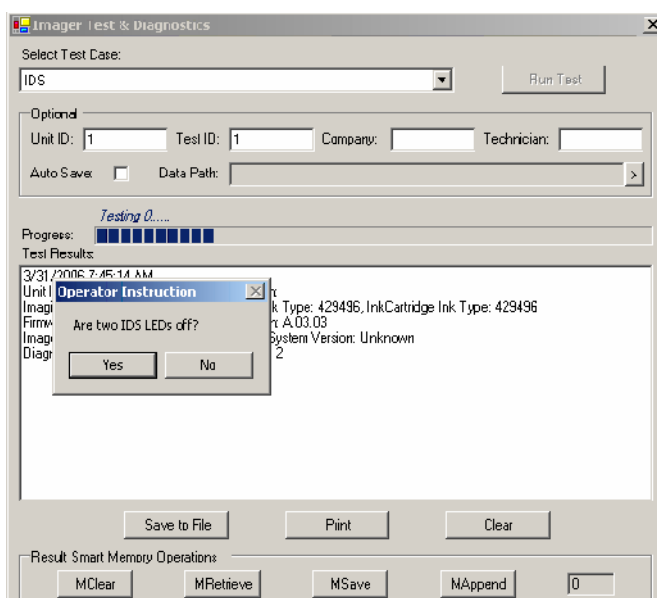
Window pops up saying "Are two IDS LEDs green?"

Click **Yes** or **No**.



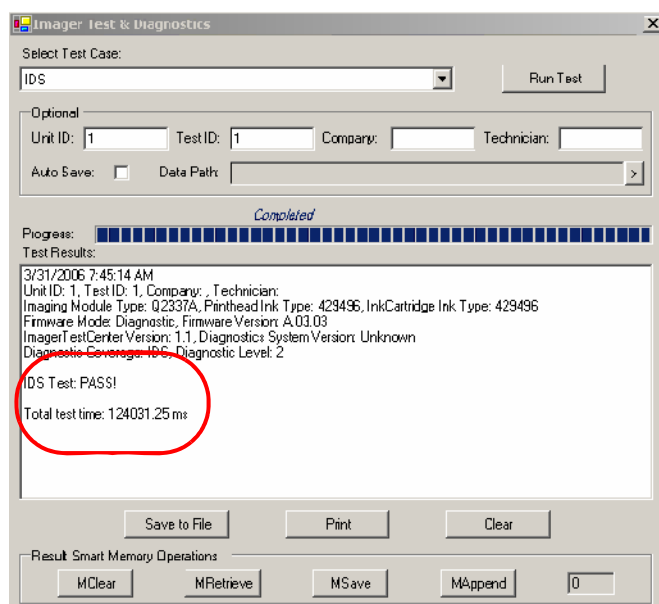
Window pops up saying "Are two IDS LEDs red?"

Click **Yes** or **No**.

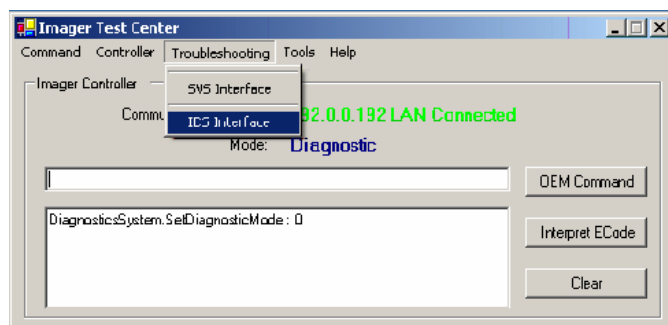


Window pops up saying "Are two IDS LEDs off?"

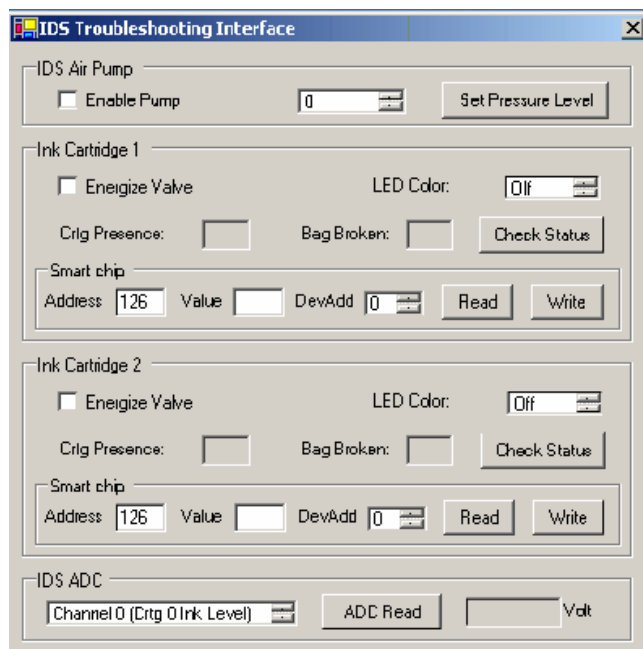
Click **Yes** or **No**.

**Illustration****Description**

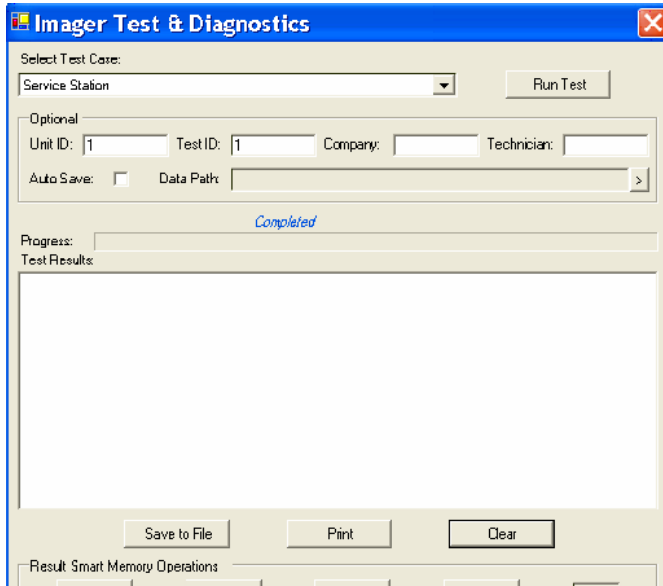
Test complete, and results show that the IDS Passed.



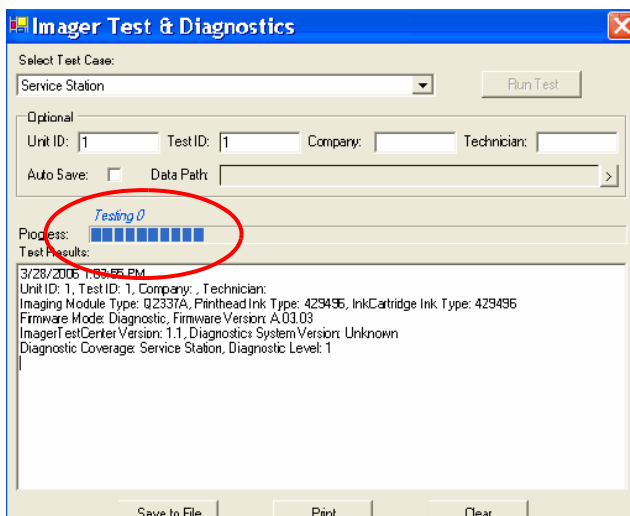
After completing IDS test, run the IDS Interface under the **Troubleshooting** tab.



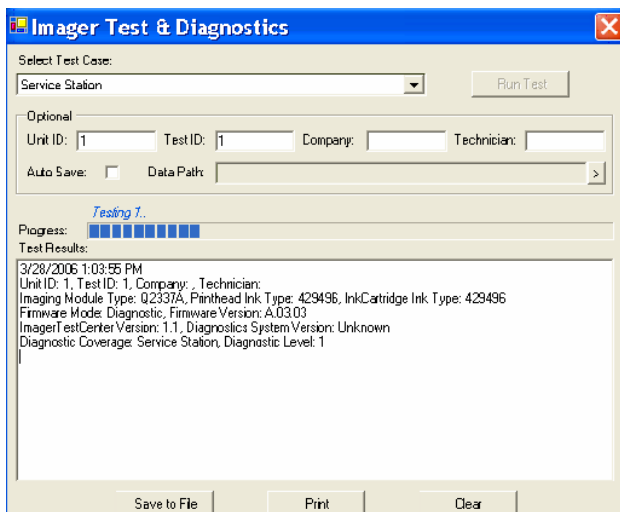
This window allows the technician to perform different functions concerning the IDS.

**Illustration****Description****Service Station**

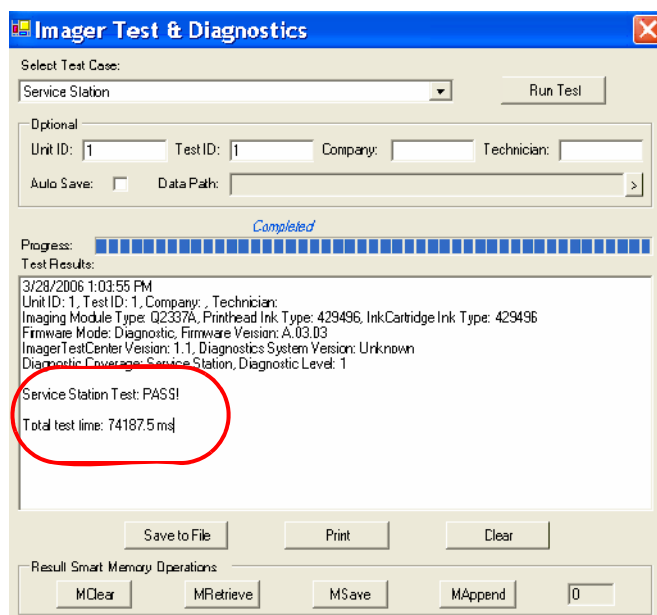
From the Select Test Case window click on Service Station and hit **Run Test**.



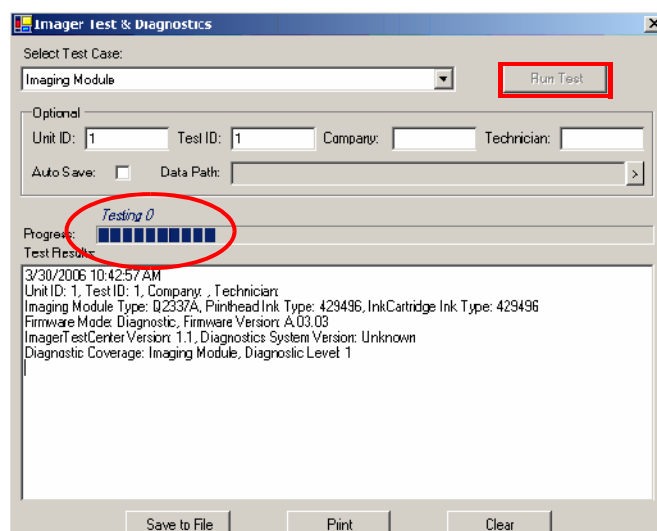
Progress shows Testing 0.



Progress shows Testing 1.

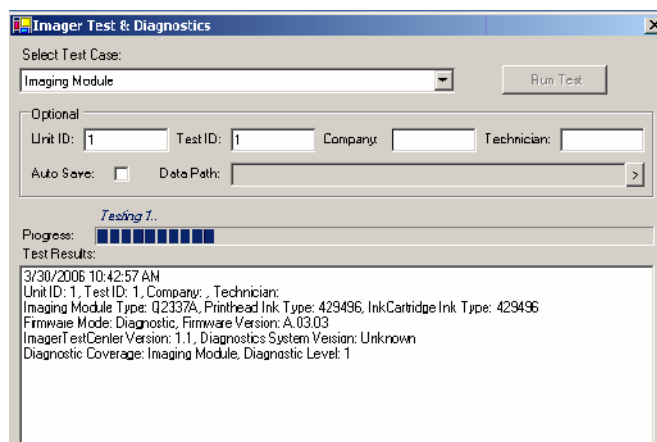
**Illustration****Description**

Progress will show **Completed** and the Test Results window will show **Pass** or **Fail**.

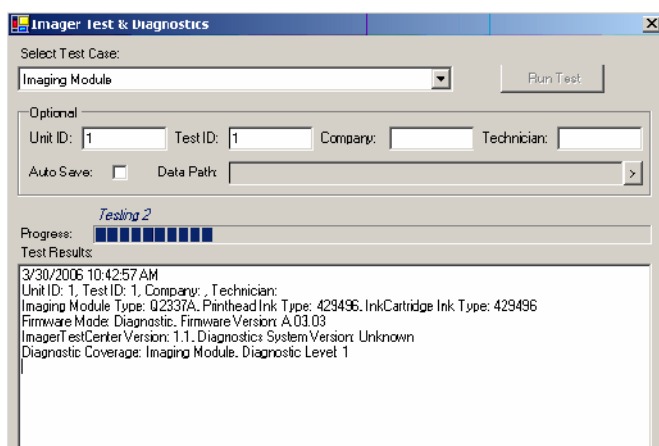
**Imaging Module**

From the Select Test Case window click on Imaging Module and hit **Run Test**.

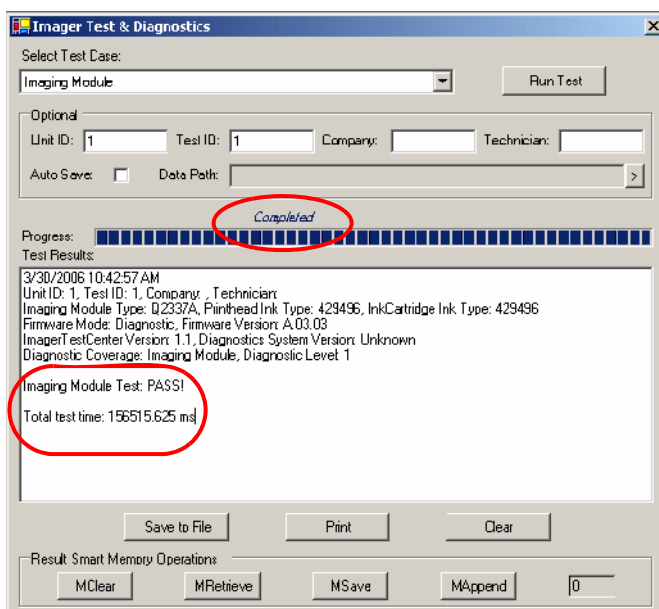
Progress shows **Testing 0**.



Progress shows **Testing 1**.

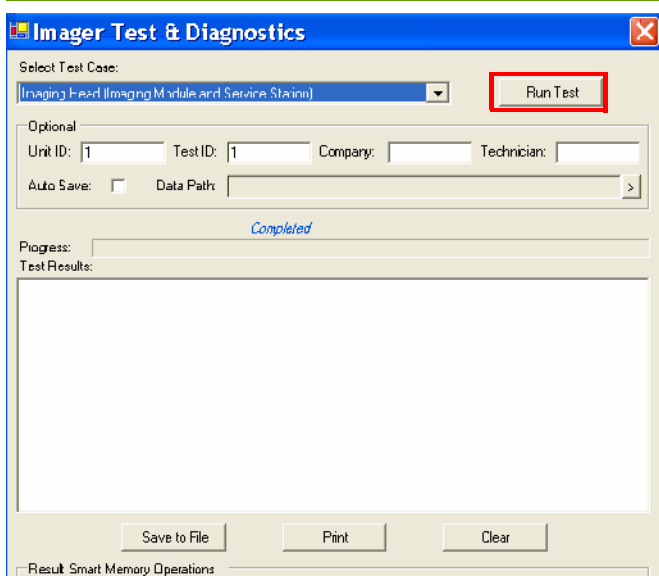
**Illustration****Description**

Progress shows Testing 2.



Progress will show Completed, and the Test Results window will show Pass or Fail.

Test complete, and results show that the Imager Module Passed.

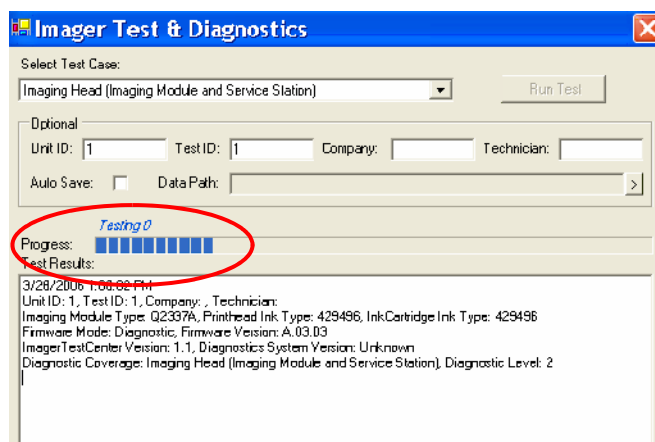


## Imaging Head (Imaging Module and Service Station)

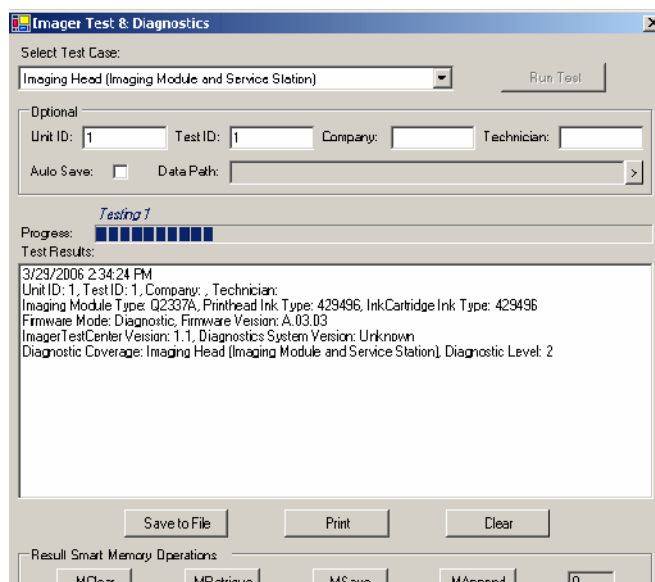
From Select Test Case, click on Imaging Head (Imaging Module and SVS), and then click on **Run Test**.

## Illustration

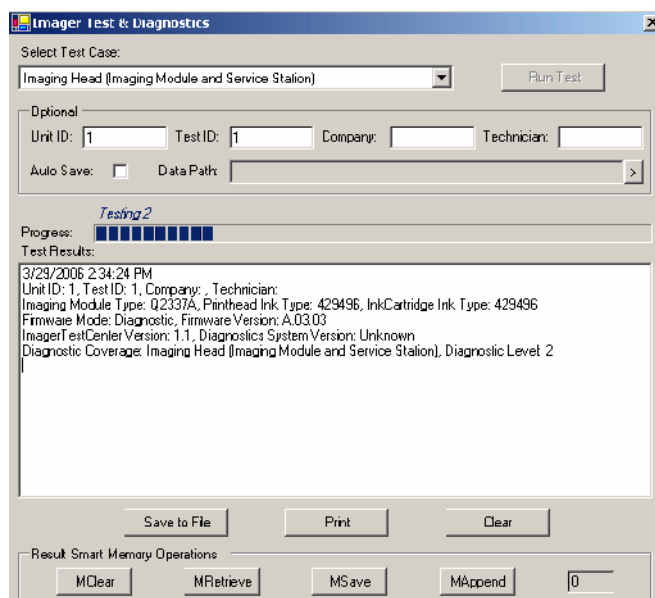
## Description



Progress shows Testing 0.



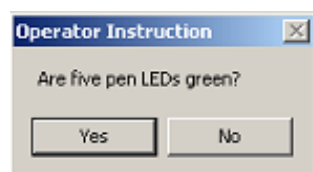
Progress shows Testing 1.



Progress shows Testing 2.

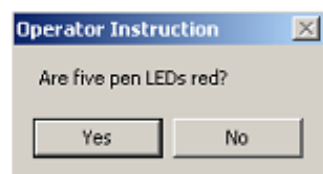
## Illustration

## Description



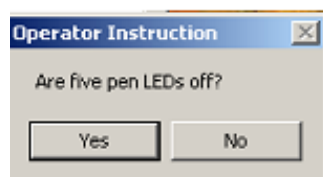
Window pops up saying "Are five pen LEDs green?"

Click **Yes** or **No**.



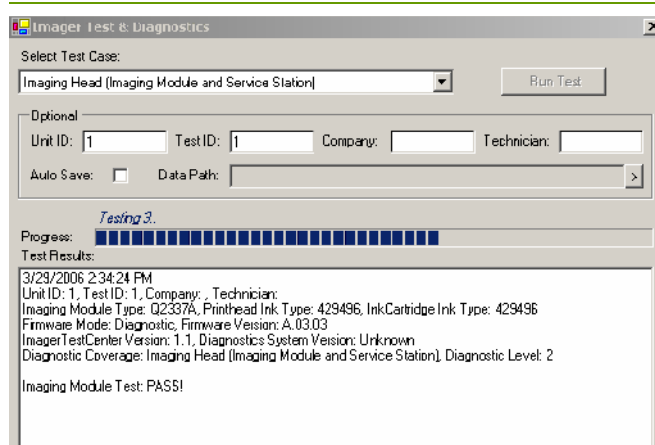
Window pops up saying "Are five pen LEDs red?"

Click **Yes** or **No**.

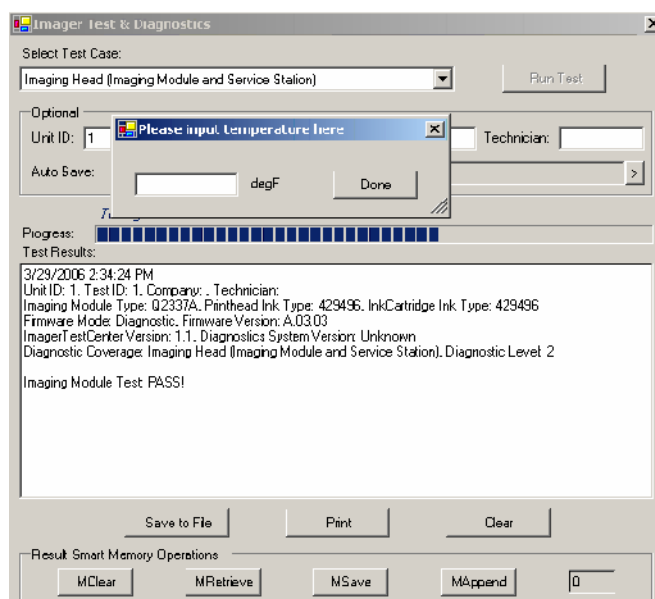


Window pops up saying "Are five pen LEDs off?"

Click **Yes** or **No**.



Progress shows Testing 3.

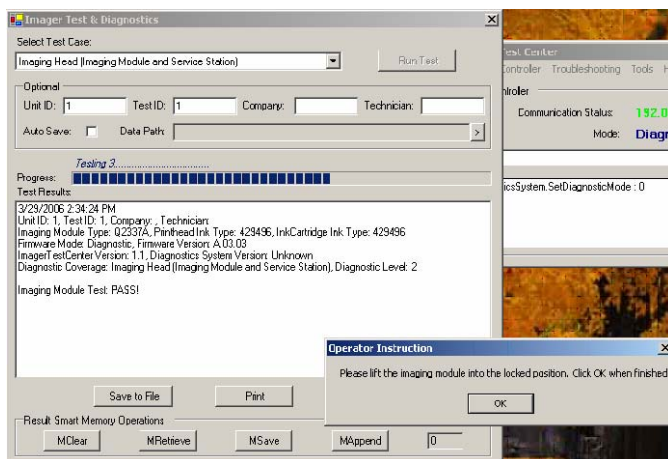


This temperature screen is a glitch that was never fixed.

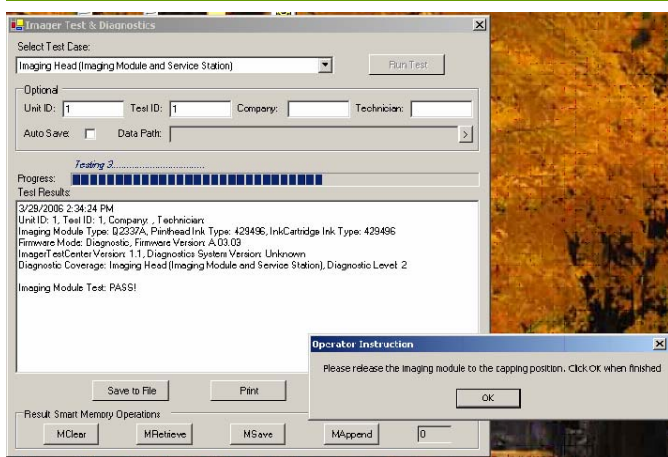
Click **Done** to continue.

## Illustration

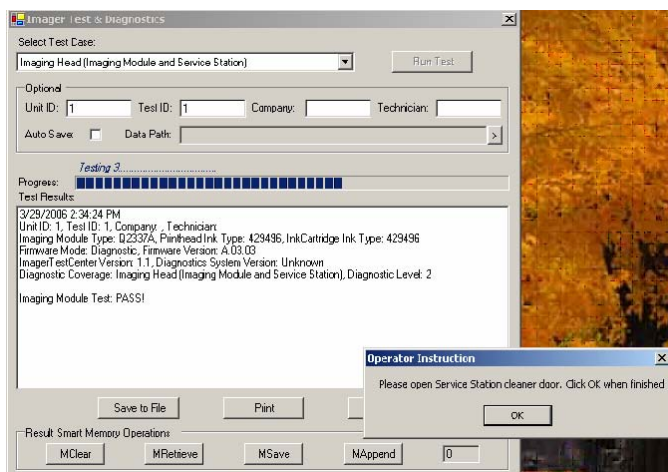
## Description



Lift the brick and click **OK**

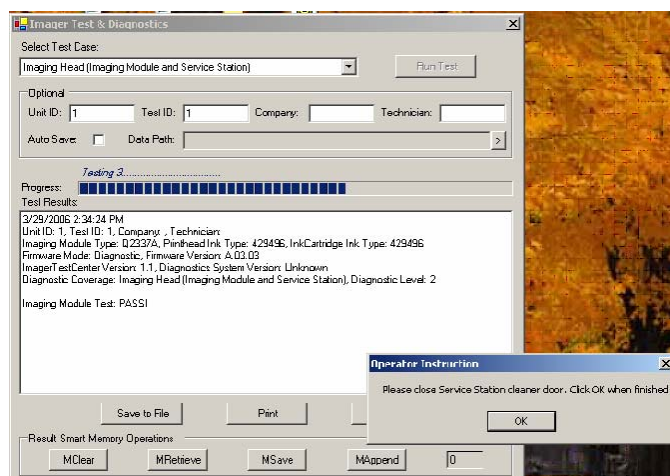


Release the brick and click **OK**.

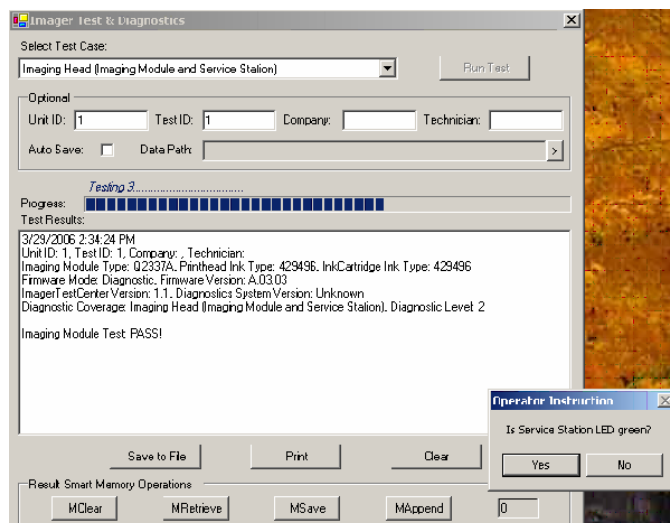


Open Service Station door and click **OK**.

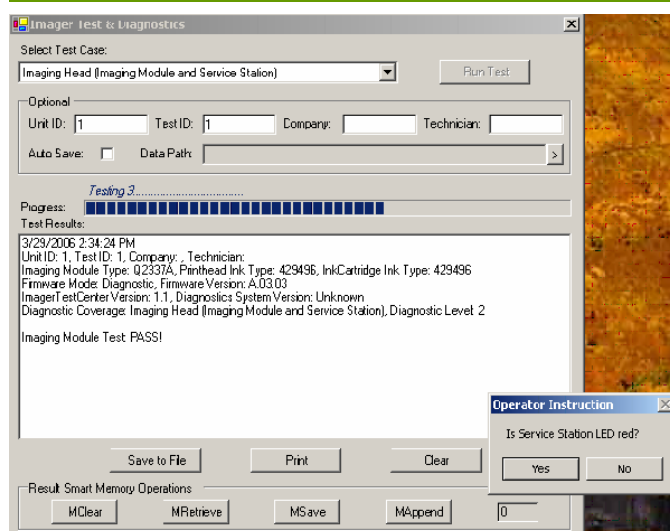


**Illustration****Description**

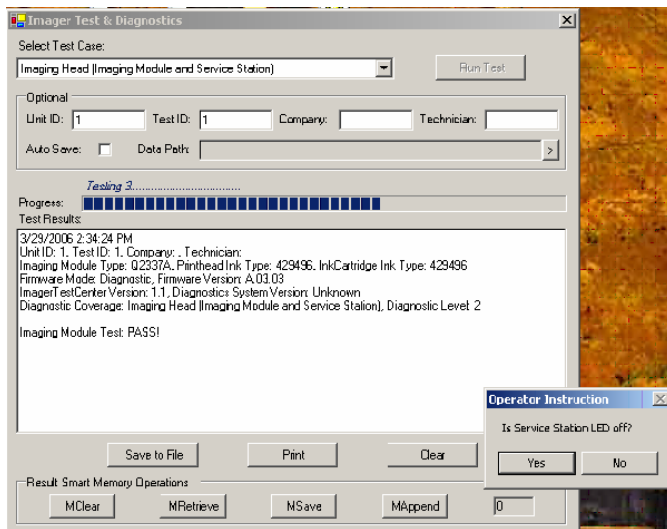
Close Service Station door and click **OK**.



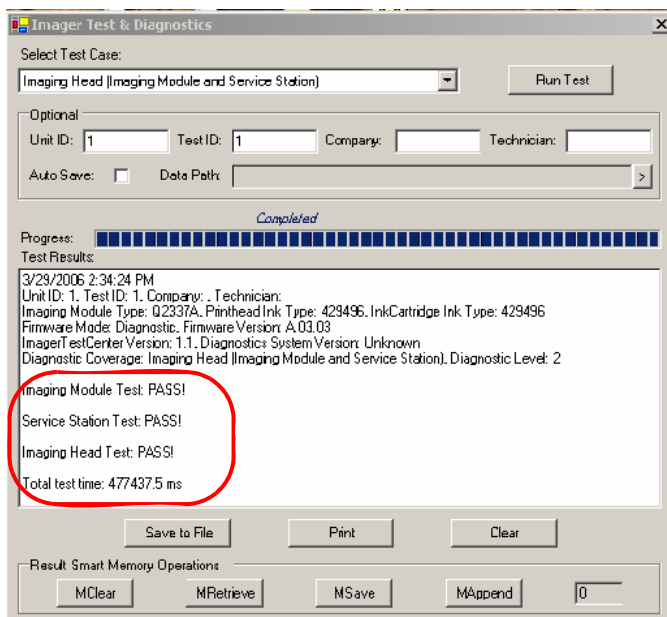
Is Service Station LED green?  
Click **Yes** or **No**.



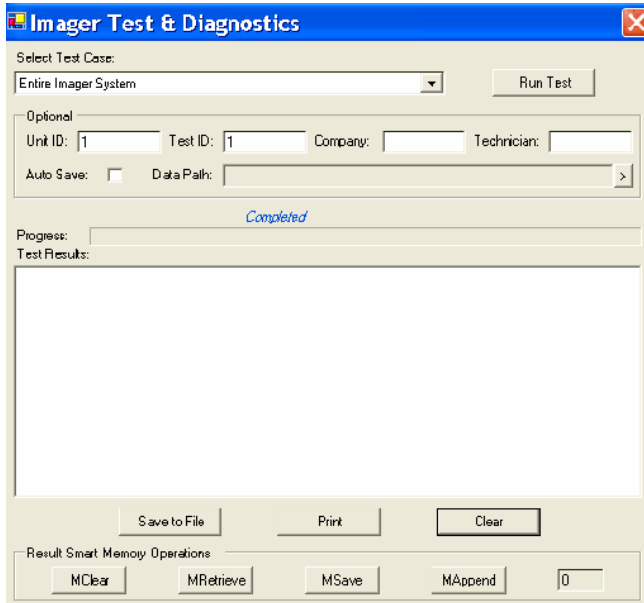
Is Service Station LED red?  
Click **Yes** or **No**.

**Illustration****Description**

Is Service Station LED off?  
Click **Yes** or **No**.

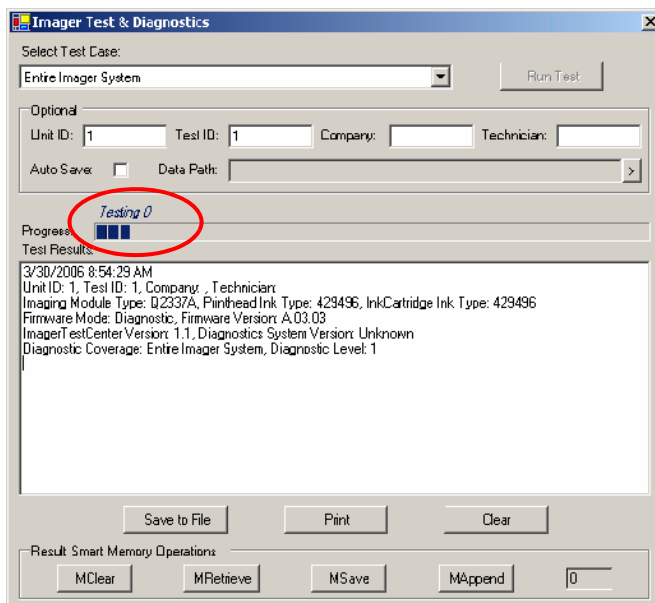


Progress will show **Completed** and the Test Results window will show **Pass** or **Fail**.  
Test complete, and results show that all tests passed.

**Illustration****Description****Entire Imager System**

Before you start, connect the TOF generator and INTC cable per the [Setup Schematic](#) in the [Engine PCA](#) test set up.

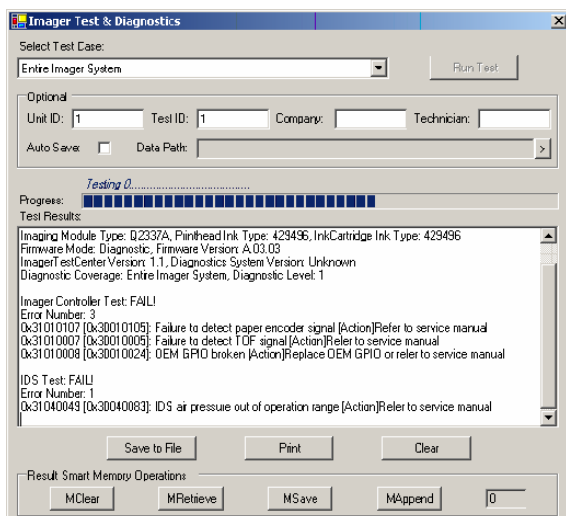
From the Select Test Case window click on Entire Imager System and **Run Test**.



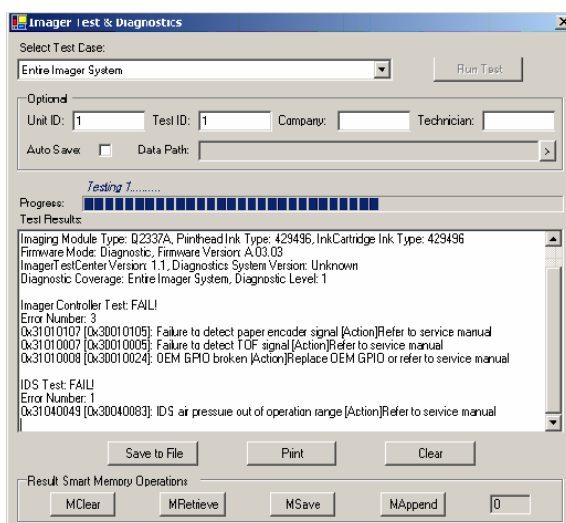
Progress shows Testing 0.

## Illustration

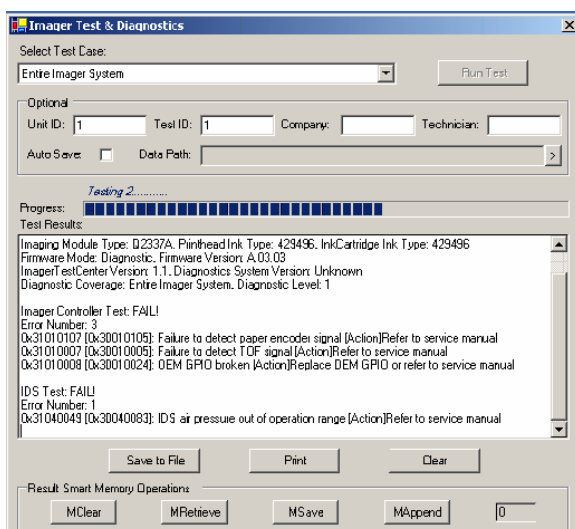
## Description



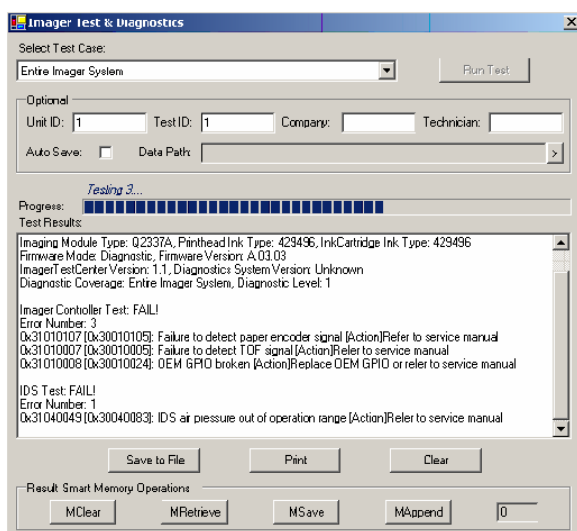
Continue testing.



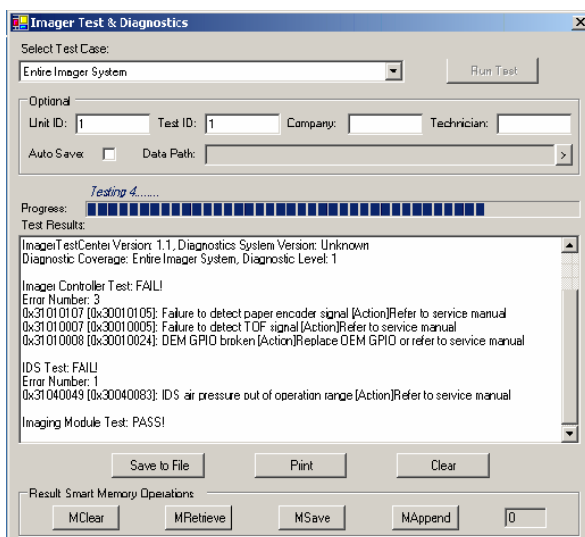
Progress shows Testing 1.



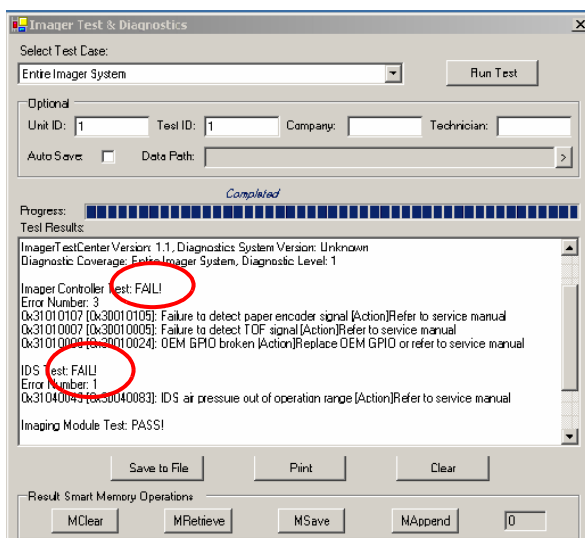
Progress shows Testing 2.

**Illustration****Description**

Progress shows Testing 3.



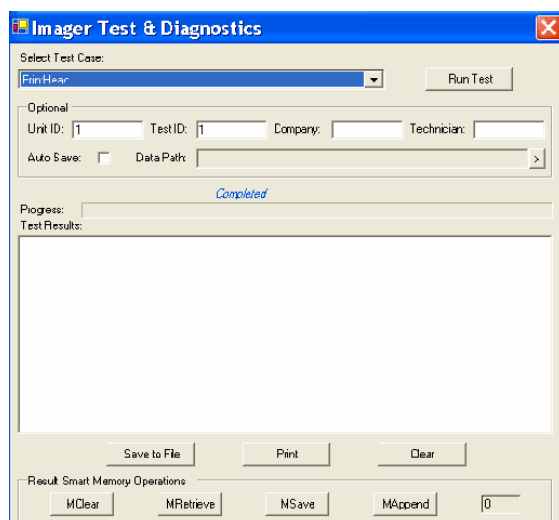
Progress shows Testing 4.



Progress will show Completed and the Test Results window will show Pass or Fail.

This image shows a Failed Imager Controller and IDS.

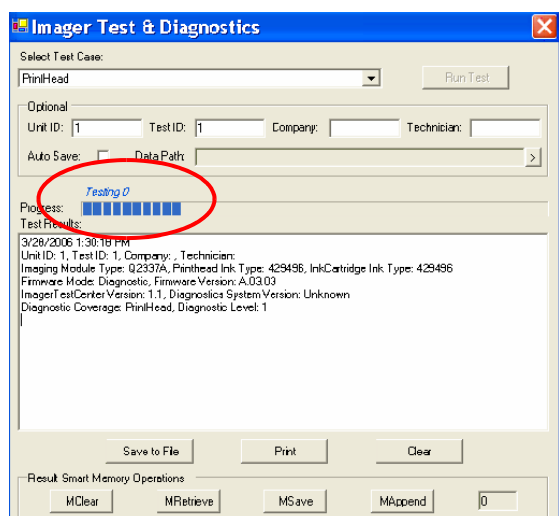
## Illustration



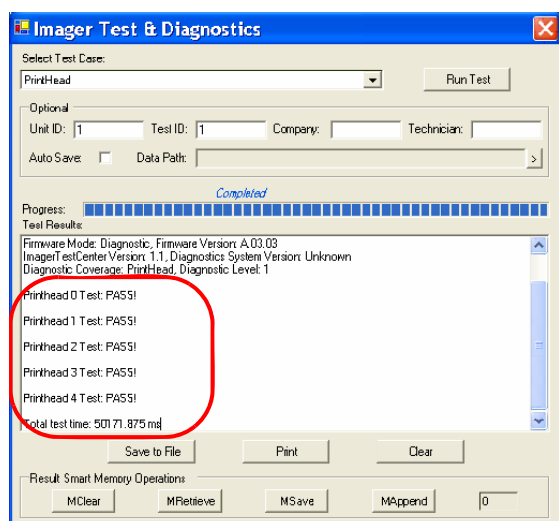
## Description

## PrintHead

From the Select Test Case window click on PrintHead and **Run Test**.

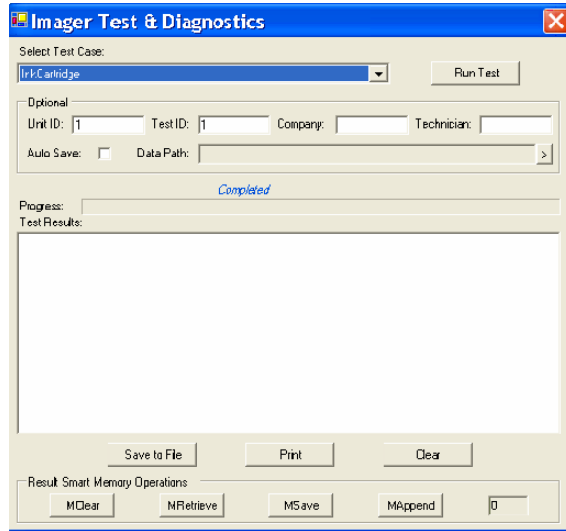


Progress shows Testing 0.



Progress will show Completed and the Test Results window will show Pass or Fail.  
All printheads passed test.

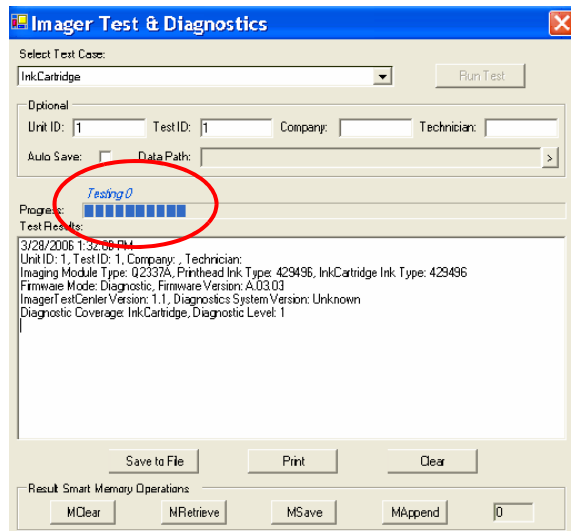
## Illustration



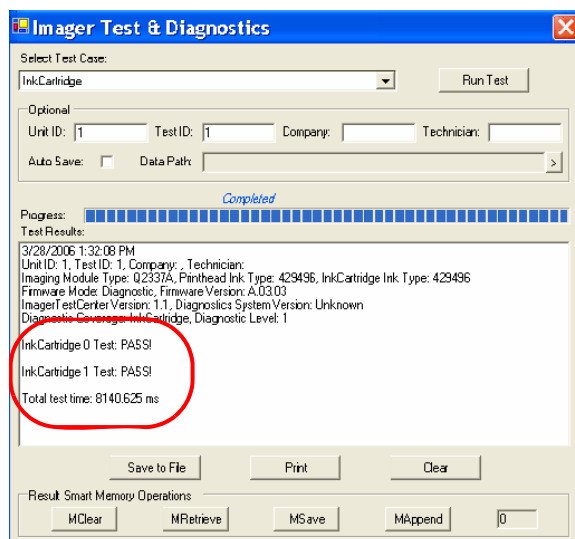
## Description

## Ink Cartridges

From the Select Test Case window click on Ink Cartridges, and **Run Test**.



Progress shows Testing 0.



Progress shows Completed.  
Testing Results window shows PASSED.

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## 6 Replacement Parts

Use the following procedures to remove and install replaceable parts. Steps have been broken up to reduce duplication.

See page 9 for Replacement Parts list.

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## General Safety Information

Remove power before replacing assemblies or cables.

Do NOT hot swap cables.

Always wear an ESD strap, per ANSI/ESD § 20, 20-1999 Protection of Electrical & Electronic Parts, Assemblies, & Equipment.

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## Handling HP Supplies

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### HP Supply Storage

Leave HP supplies (printhead and ink cartridges) in their factory packaging until installation into a printing system.

Once the HP supplies are placed into a printing system, it is recommended that they not be removed for the duration of their service.

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### Removal and Storage of HP Supplies

The HP ink cartridge supply is very durable and requires very little maintenance or special care. If needed, remove the ink cartridge supply from the ink Service Station, and store it in a clean, dry location away from direct sunlight at a temperature between 0-40°C.

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### Removal and Storage of Printheads

HP printheads require specific care and storage if they are removed from the printing system, to ensure that they can be returned to service and will operate correctly.

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## To Remove a Printhead

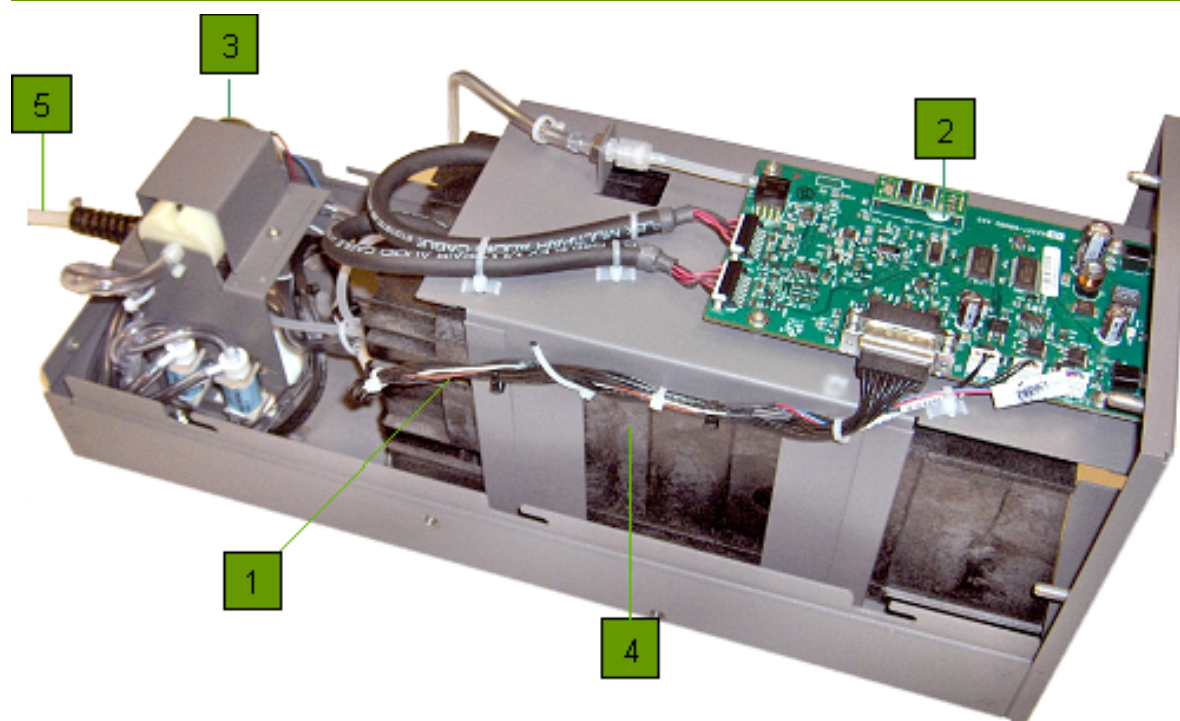
1. Press and release the blue latch release.
2. Lift the latch up, exposing the printhead.
3. Lift the blue handle on the printhead and gently pull upward.
4. Store printhead in the approved docking station, HP Part Number Q7478A.

# Ink Delivery System Replaceable Parts

**CAUTION:** Whenever removing or installing the IDS PCA, be careful not to create a kink by over-bending the tube. Also, do not stress the pressure transducer by pushing or pulling on it during installation or tightening the tube fitting.

**Table 6-1** IDS replaceable parts

Item #	Service Part Number	Replacement Part/Assembly
1	Q2337-67023	OEM IDS Internal Cable
2	Q2327-67005	OEM PCA Ink Delivery System
3	Q2326-67016	OEM Pressure Control Module
4	Q2326-67015	OEM Ink Stall Assembly
5	Q2326-67017	OEM Tube Ink Flow Assembly



## Replacement Procedures

All of these following procedures have been broken down to eliminate duplication. For example, the procedure to remove the cover will be given once, rather than repeated several times as a part of larger procedures.

## Remove the IDS from the Box

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### Illustration

### Description

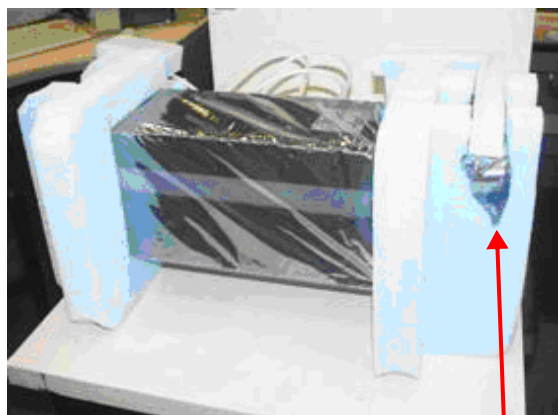
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Open the Ink Delivery System (IDS) packaging with a razor blade.



Remove the IDS from the packaging box.

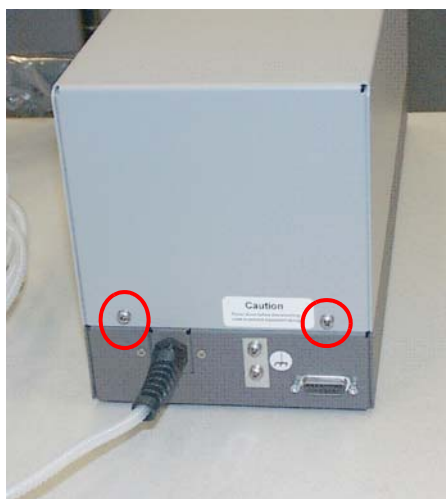


Crane

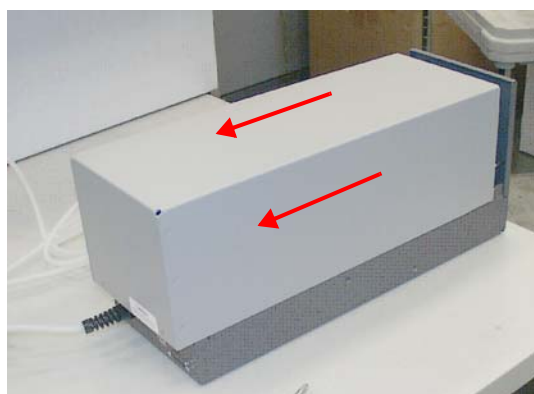
Remove the foam and bag from the IDS.  
Place the foam and bag back into the box.  
Leave the bag on the Crane portion of the IDS.

## Remove the Cover

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**Illustration****Description**

Remove the two screws to release the top case using a Phillips head screwdriver.



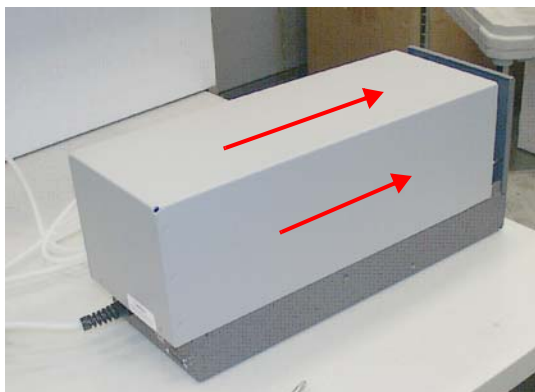
Slide the top case towards the rear of the IDS and lift it to remove.

## Replace the Cover

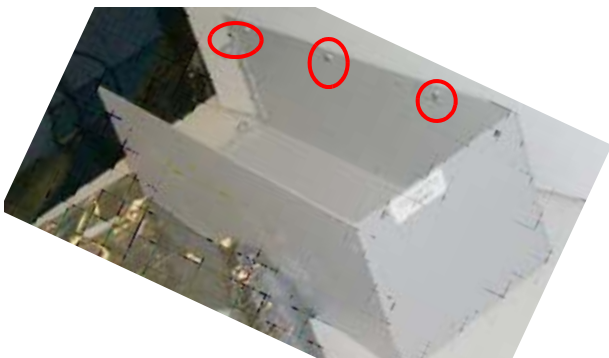
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### Illustration

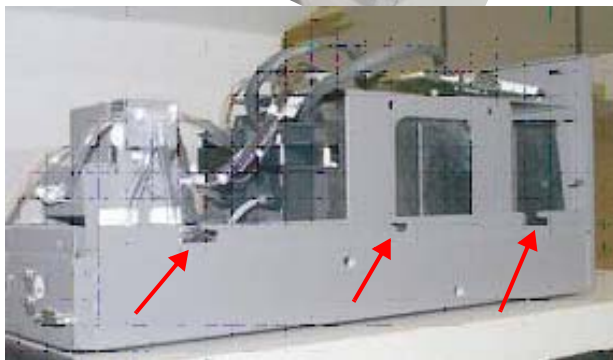
### Description



Slide the top case onto the IDS towards the front of the unit.



The 3 standoffs slide into the grooves on the body of the IDS.

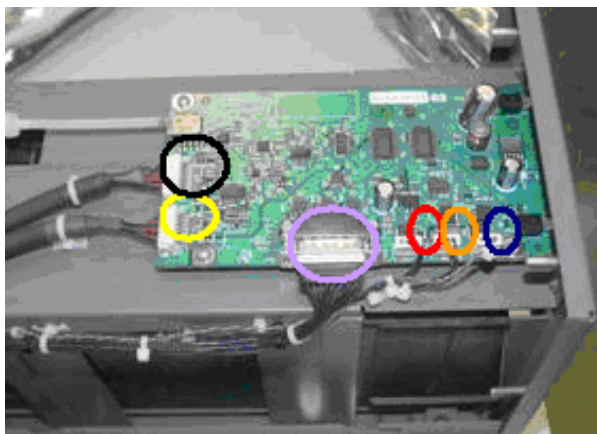


Insert two screws to hold the top case in place using a Phillips head screwdriver.



## Remove the PILS PCA

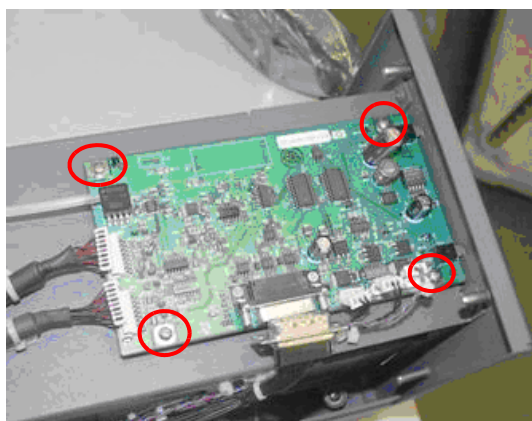
### Illustration



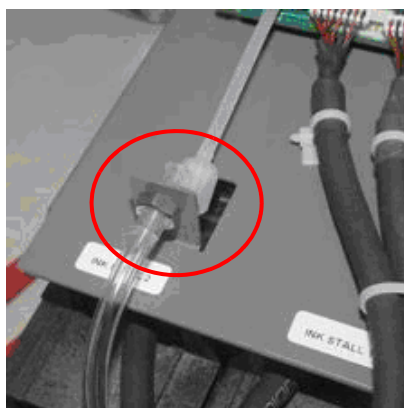
### Description

Remove the cables from the PILS PCA.

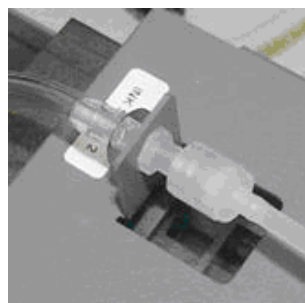
- Valve 2
- Valve 1
- Air pump
- Ink stall 1
- Ink stall 2
- IO cable



Remove the 4 screws from the PILS PCA.



Unscrew the air pump valve to release the PILS PCA from the IDS.





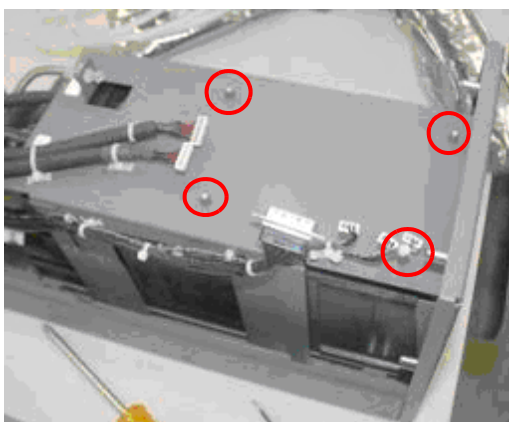
## Replace the PILS PCA

### Illustration

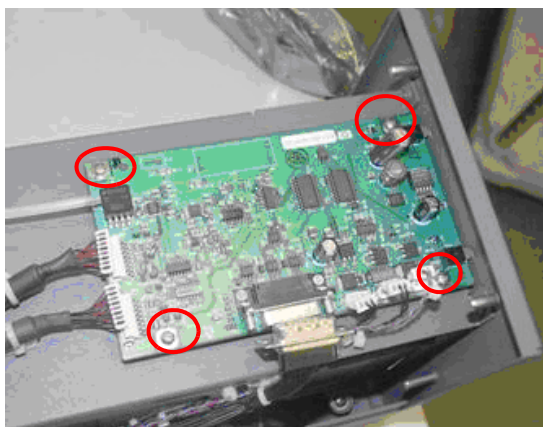
### Description



Install the PILS PCA.

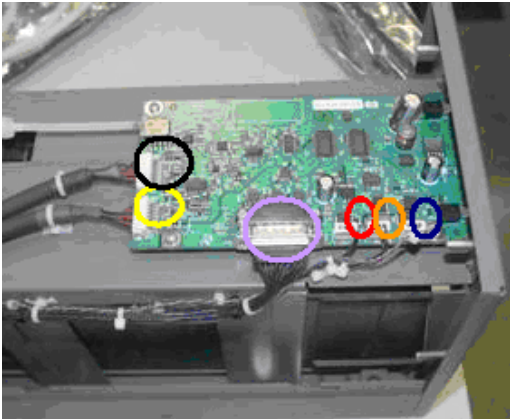
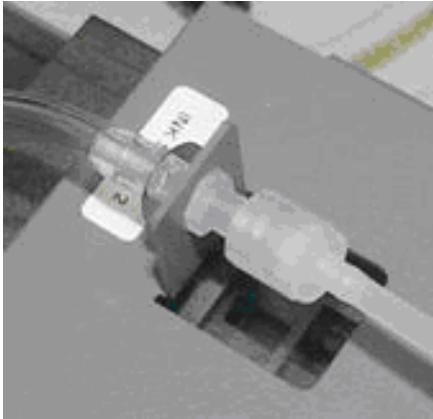


Place the PCA onto the four standoffs, and align the screw holes on the board.



Insert the four screws, but do not tighten them until **all** screws are inserted.



Illustration	Description
	<p>Insert the cables into the PILS PCA.</p> <ul style="list-style-type: none"> <li><span style="color: red;">●</span> Valve 2</li> <li><span style="color: orange;">●</span> Valve 1</li> <li><span style="color: blue;">●</span> Air pump</li> <li><span style="color: yellow;">●</span> Ink stall 1</li> <li><span style="color: black;">●</span> Ink stall 2</li> <li><span style="color: purple;">●</span> IO cable</li> </ul>
	<p>Screw the valve into the fitting.</p>
<p><b>Replace the cover.</b></p>	

## Remove the Pressure Control Module


Illustration	Description
	<p><b>Remove the Cover</b></p> <p><b>Remove the Pressure Control Module</b> Remove the four cables from the connectors.</p> <ul style="list-style-type: none"> <li><span style="color: red;">●</span> Valve 2</li> <li><span style="color: orange;">●</span> Valve 1</li> <li><span style="color: blue;">●</span> Air pump</li> <li><span style="color: purple;">●</span> IO cable</li> </ul>

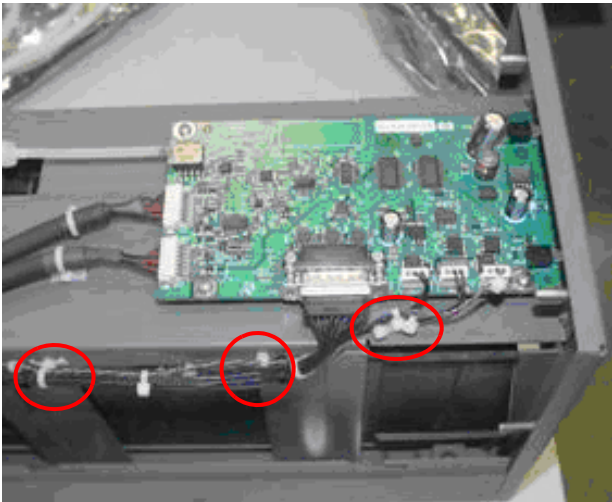
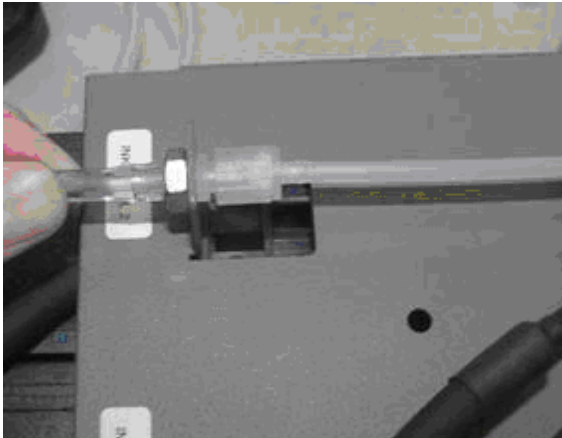
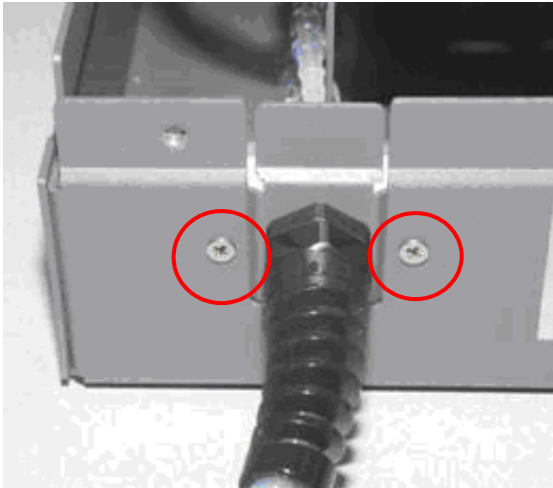
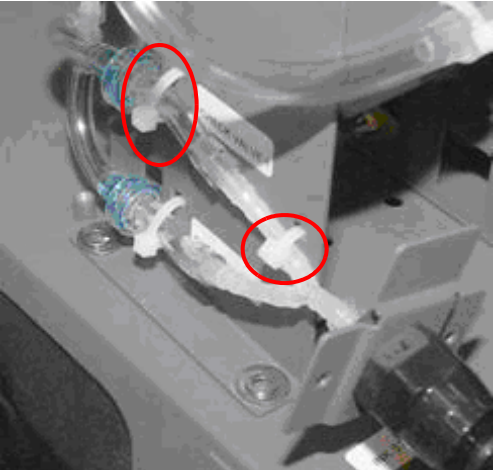
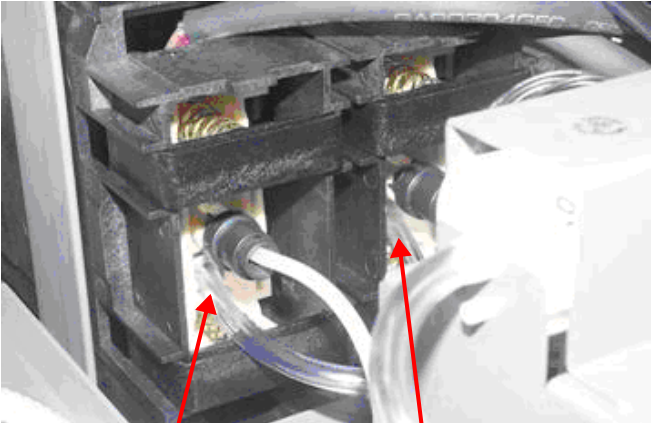
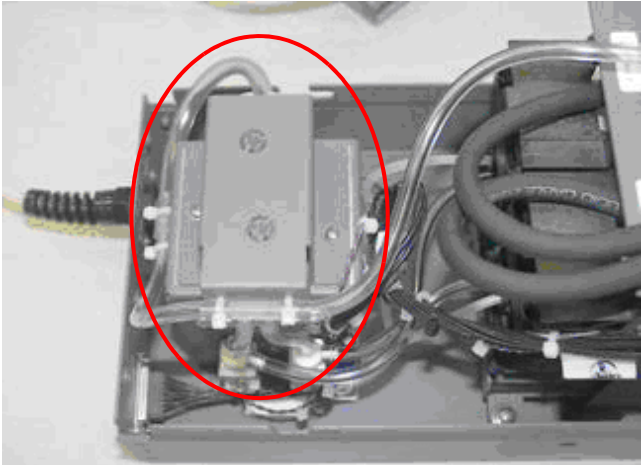
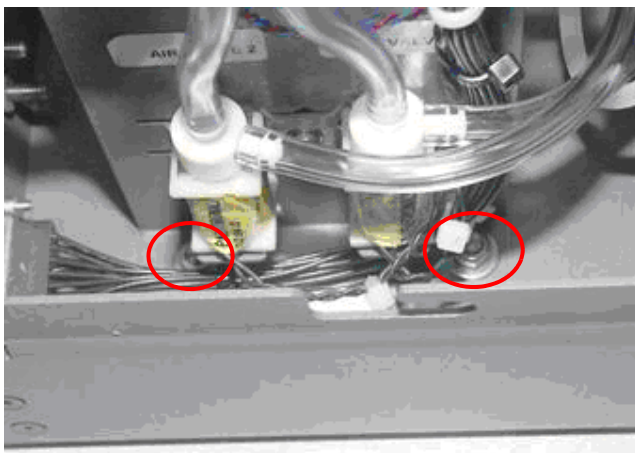
Illustration	Description
	Cut the tie wraps to release the cables.
	Remove the air pump tubing from the plastic valve fitting.
	Remove the two screws from the strain relief to release it from the IDS.

Illustration	Description
	Cut the tie wraps.
	Remove the air valve tubes from the ink stall assemblies.  <b>NOTE:</b> For easier removal, flip the unit vertically and remove the air valve tubes with tweezers.
	Remove the Pressure Control Module by unscrewing the two nuts from each side of the module.

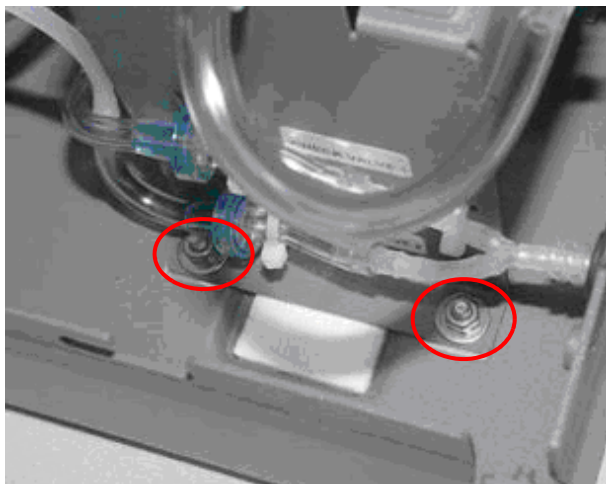
## Illustration

## Description

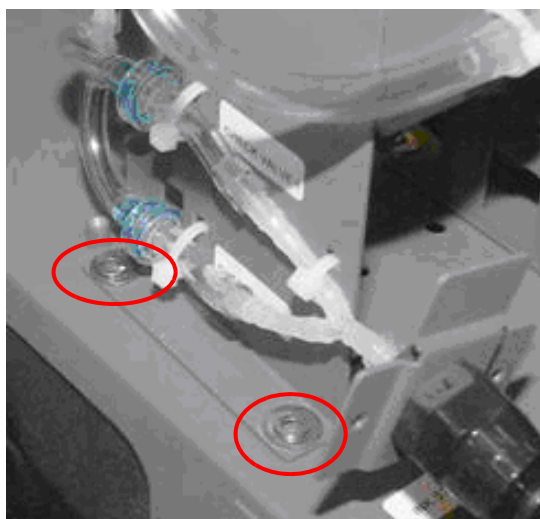


Remove the two nuts using a 9/32 nut driver. Use needle-nose pliers or your fingers to push cables away.

**NOTE:** You may need a special tool, as the nut in front of air valve 1 is hard to access. The tie wrap may need to be cut.



Remove the two nuts using a 9/32 nut driver.



Remove the washers from both sides of the module. Carefully pull the module out with the washers on, or;  
Use needle-nose pliers to pull the washers out with the module in the unit.  
Lift the pressure control module to remove it.  
Now the Ink Tube Assembly can be moved out of the way.

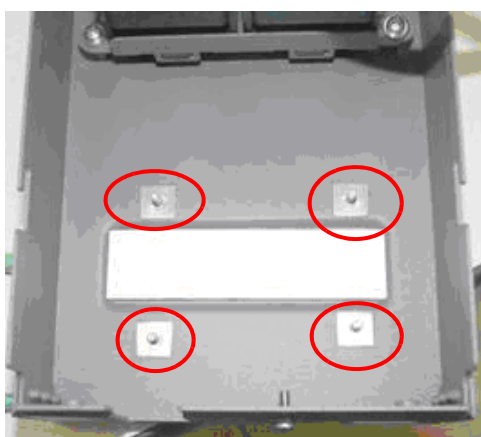
## Install the Pressure Control Module

### Illustration

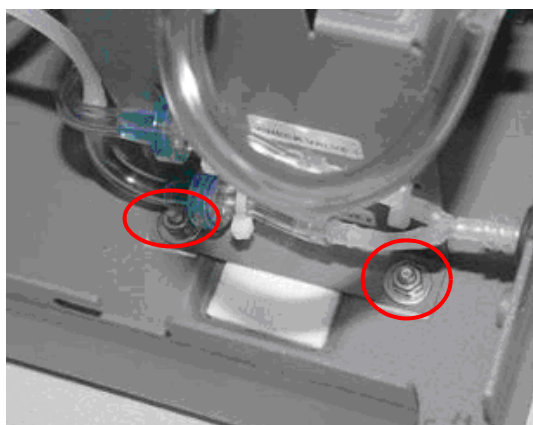


### Description

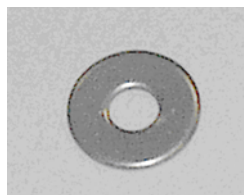
Insert Pressure Control Module into the IDS with the air valves opposite of the Ink Tube Assembly.



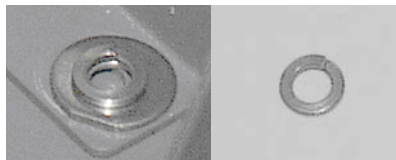
Place the module onto the IDS, lining it up with the two standoffs.



Place a washer onto each standoff.



Place a split lock washer onto each standoff.



Place a nut onto each standoff and tighten with a 9/32 nut driver.

Replace cut cable ties.

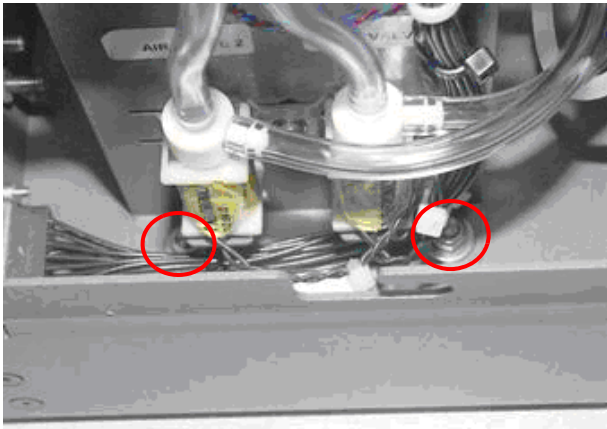
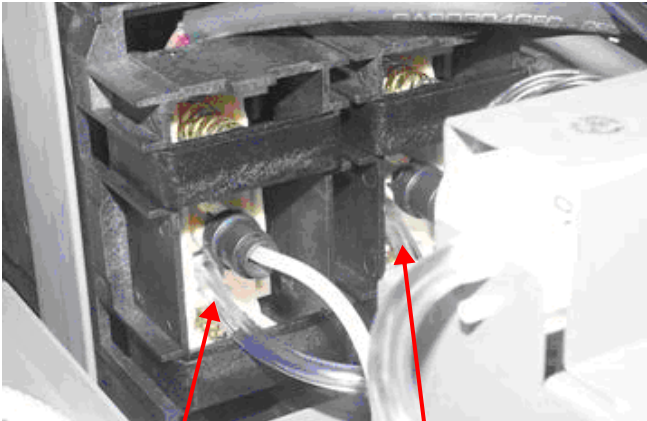
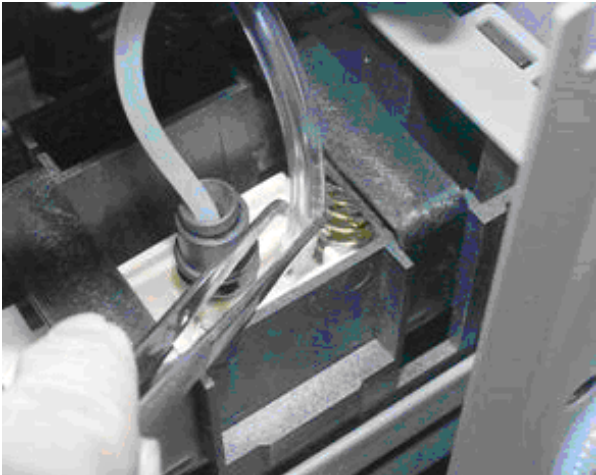
Illustration	Description
	<p>Place the washer, split lock washer, and nut onto the two standoffs and tighten with a 9/32 nut driver. Push the cables away with your fingers or needle-nose pliers to access the nut.</p> <p><b>NOTE:</b> You may need a special tool, as the nut in front of air valve 1 is hard to access.</p>
 <p data-bbox="300 1171 432 1205">Air Valve 2</p> <p data-bbox="608 1171 740 1205">Air Valve 1</p>	<p>Insert the air valve tubing into the stalls.</p>
	<p>Use curved tweezers to push the air valve tubing into place.</p> <p><b>NOTE:</b> It is not easy to push the tubing into place.</p>



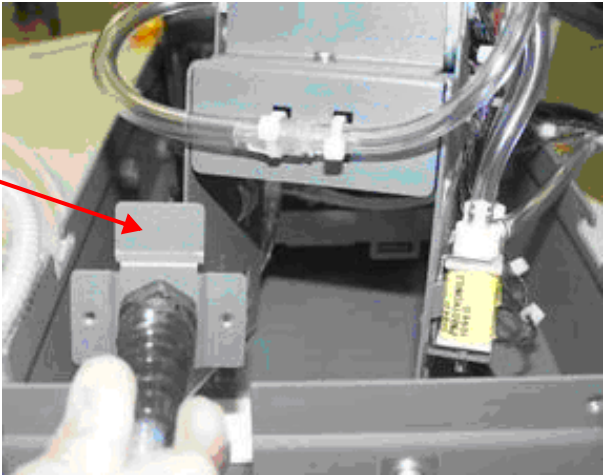

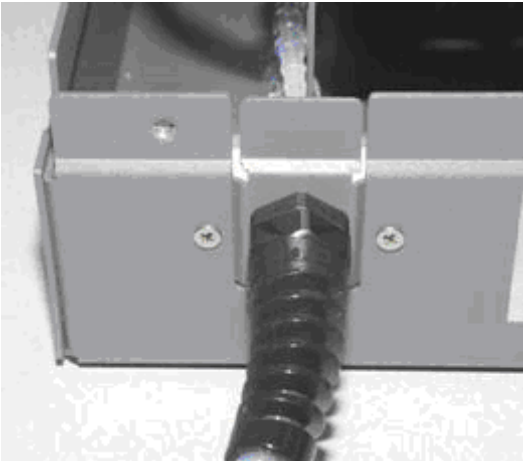
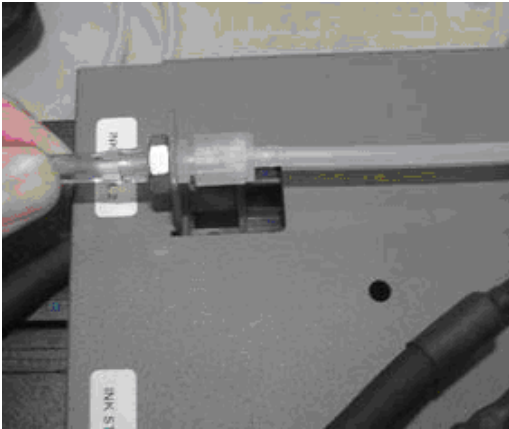
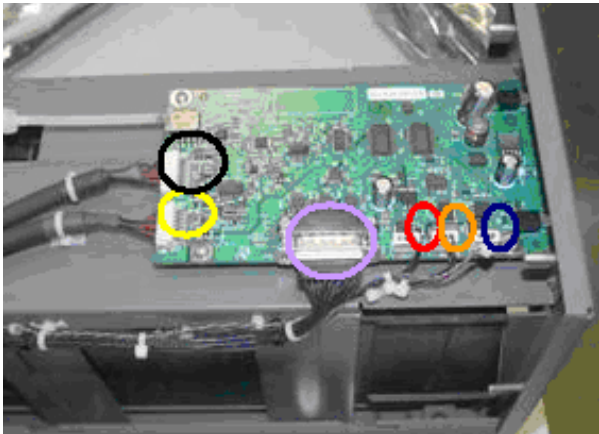
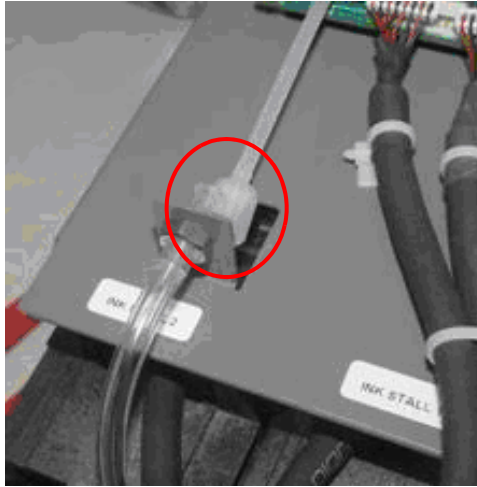
Illustration	Description
	Position the strain relief tube so the metal tab is facing up.
	Insert the strain relief tubing, and line it up with screw holes.
	Insert the two screws, and tighten them using a Phillips head driver.

Illustration	Description
	<p>Plug the tubing into the plastic valve fitting.</p> <p>Replace cut cable ties where removed to release the air valve cables.</p>
Replace the cover.	

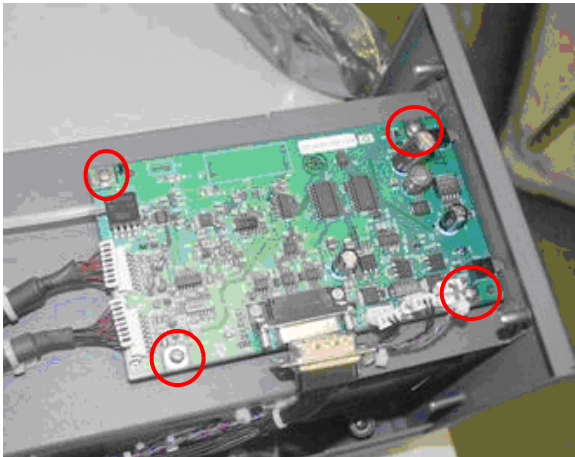
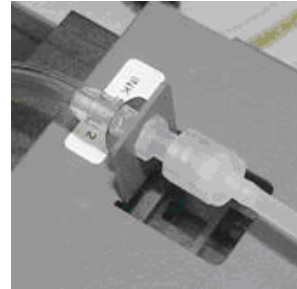
## Remove Ink Stall Assembly

Illustration	Description
	<b>Remove the Cover</b>
	<b>Remove the PILS PCA</b>
	<p>Remove the cables from the PILS PCA.</p> <ul style="list-style-type: none"><li><span style="color: red;">●</span> Valve 2</li><li><span style="color: orange;">●</span> Valve 1</li><li><span style="color: blue;">●</span> Air pump</li><li><span style="color: yellow;">●</span> Ink stall 1</li><li><span style="color: black;">●</span> Ink stall 2</li><li><span style="color: purple;">●</span> IO cable</li></ul>



**Illustration****Description**

Unscrew the valve leading to the Air Pump to release the PILS PCA from the IDS.



Remove the four screws from the PILS PCA.



Remove the PCA and place it into an ESD safe bag.

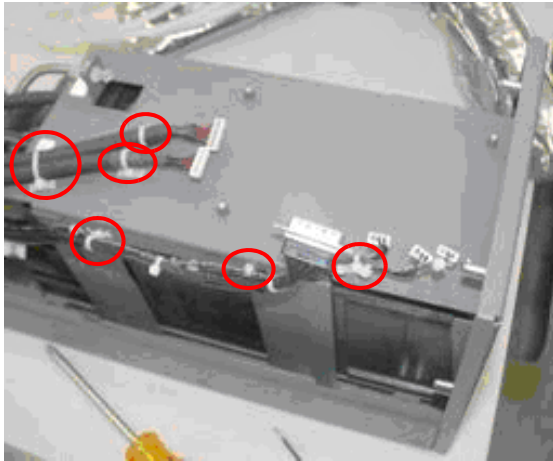
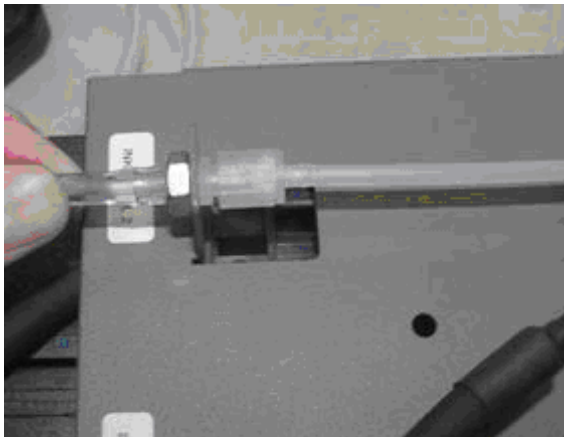
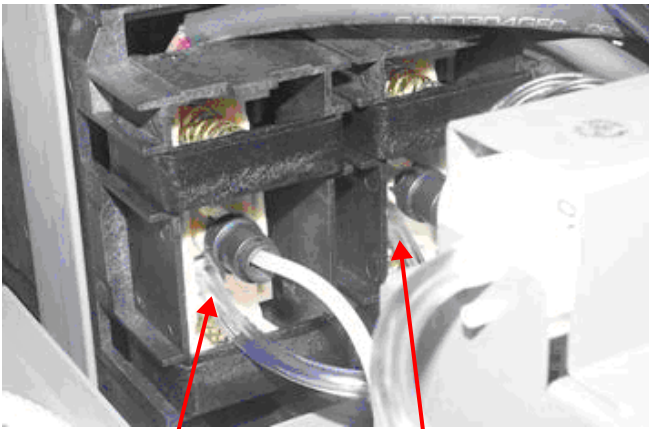
Illustration	Description
	<p>Cut the tie wraps to remove the cables from the PCA support bracket.</p>
	<p>Remove the air pump tubing from the plastic valve fitting.</p>
 <p data-bbox="295 1665 422 1696">Air Valve 2</p> <p data-bbox="603 1665 730 1696">Air Valve 1</p>	<p>Remove the air valve tubes from the ink stall assemblies.</p> <p><b>NOTE:</b> For easier removal, flip the unit vertically and remove the air valve tubes with tweezers.</p>

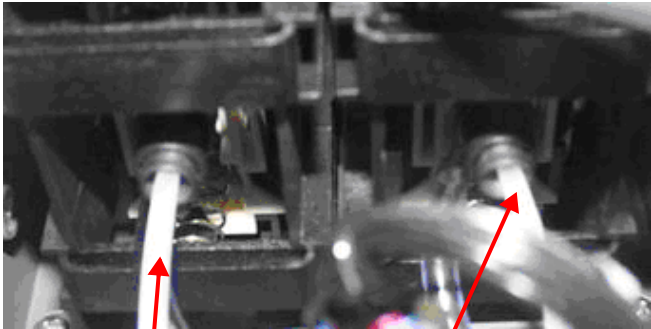
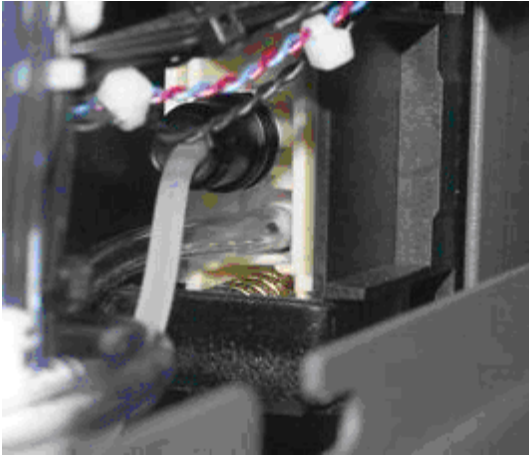
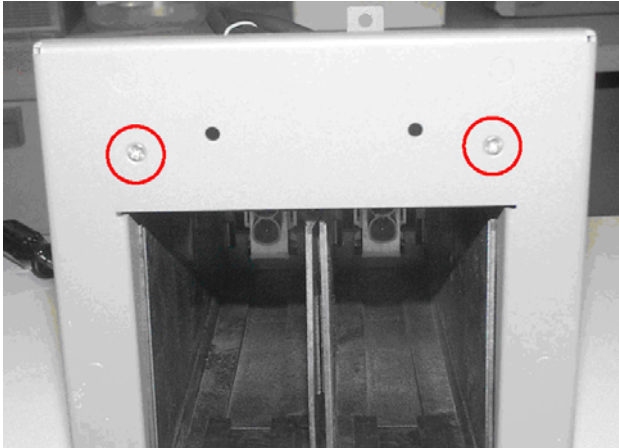
Illustration	Description
 <p data-bbox="355 615 478 640">Ink Tube 2</p> <p data-bbox="655 615 778 640">Ink Tube 1</p>	Remove the ink tubes from the stalls.
	A closer look at the ink tube and air valve.
	Remove the two screws from the front of the top case using a Phillips head driver.

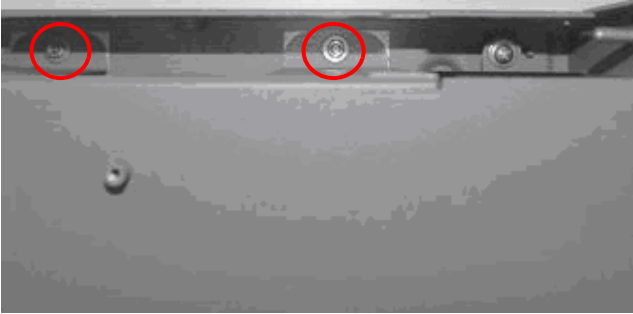
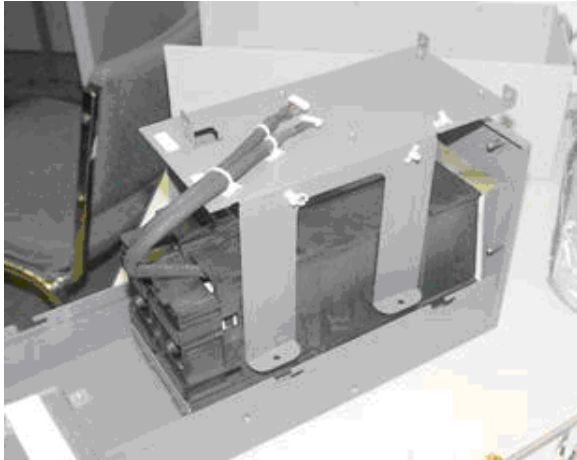

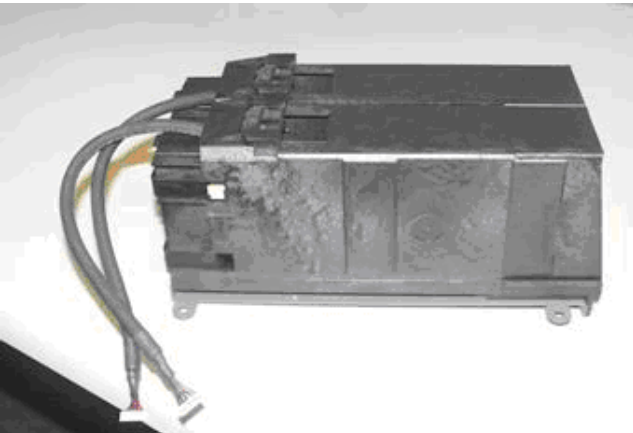

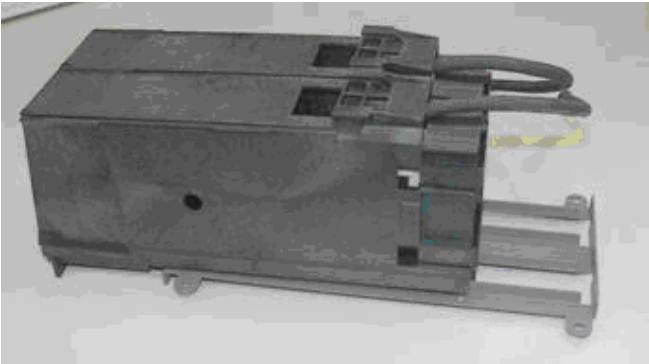
Illustration	Description
	Remove the two nuts from each side of the stalls with a 9/32 nut driver.
	Cut the tie wraps holding the ink stall cable, and then lift and remove the cover from the ink stalls. Use a 7mm nut driver.
	Remove the two screws from each side with a Phillips head driver to release the ink stalls from the IDS.
	Lift and remove the stalls from the IDS.

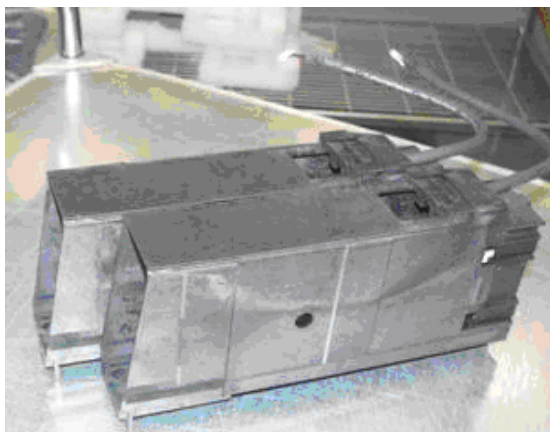
Illustration	Description
	Remove the four screws from the front of the stalls on the bottom.
	Slide the stalls off of the mounting bracket.

## Install the Ink Stall Assembly

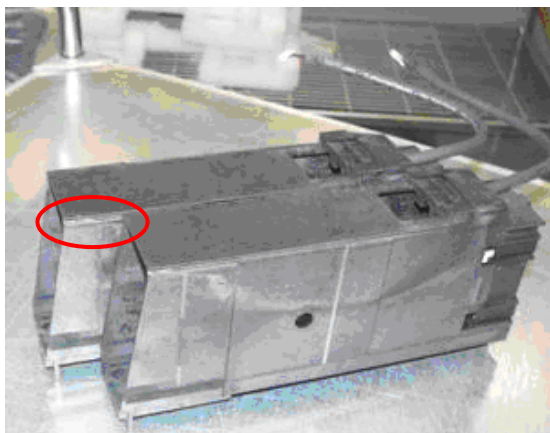
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### Illustration

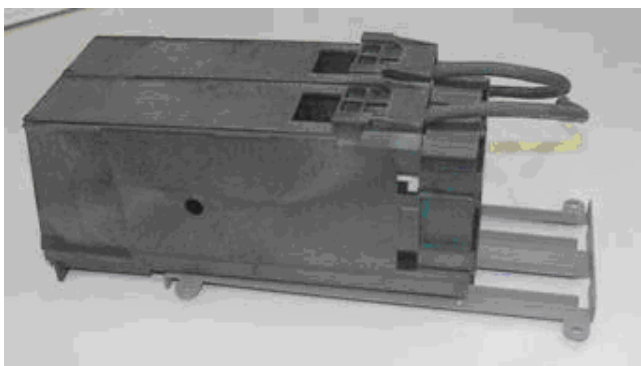
### Description



Slide the stalls apart, and replace the bad stall with a new ink stall assembly.



Slide the stalls together, moving along the groove.



Slide the stalls onto the mounting plate bracket.



**Front of  
Bracket**

**Back of  
Bracket**





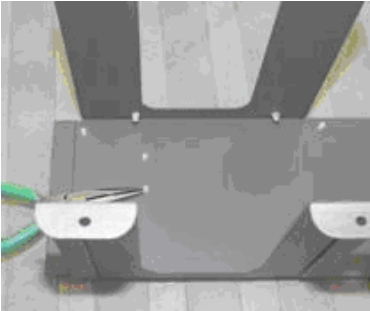

Illustration	Description
 <p data-bbox="459 380 671 405">Front Side of Plate</p>  <p data-bbox="475 583 683 609">Back Side of Plate</p>	<p data-bbox="938 262 1457 315">The stalls fit into the tabs in the front and the back of the bracket.</p>  <p data-bbox="970 615 1027 640">Front</p> <p data-bbox="1315 615 1372 640">Back</p> <p data-bbox="978 678 1318 705"><i>Bottom view of mounting bracket</i></p>
	<p data-bbox="938 741 1457 793">Install four screws, and tighten them from the front of the IDS on the bottom.</p>
 	<p data-bbox="938 1262 1457 1314">Remove the old tie wraps with needle-nose pliers, and replace them with new ones.</p>



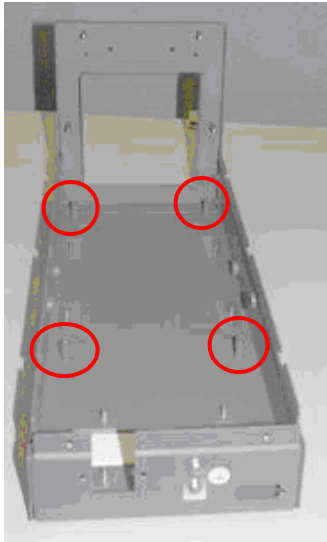

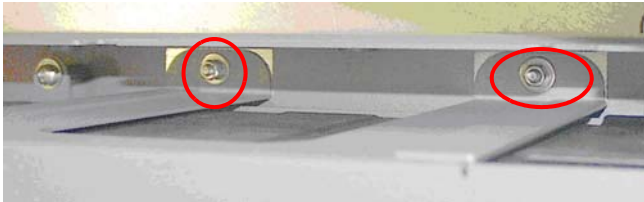



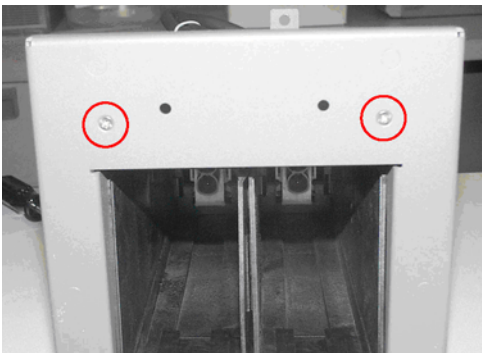
Illustration	Description
	<p>Place the mounting bracket and stalls onto the IDS chassis, aligning them with the four standoffs.</p> <p>Install the two screws, and tighten them on both sides with a Phillips head driver.</p>
 	<p>Place the cover over the stalls in position over the standoffs.</p> <p>Place the two flat washers on the two standoffs.</p> <p>Place the two split lock washers on the two standoffs.</p> <p>Place the two nuts on the standoffs, and tighten them with a 9/32 nut driver.</p> <div data-bbox="890 1083 1406 1325"><p>flat washer      split lock washer      two washers, stacked</p></div>
	<p>Insert the two screws, and tighten them with Phillips head driver.</p>



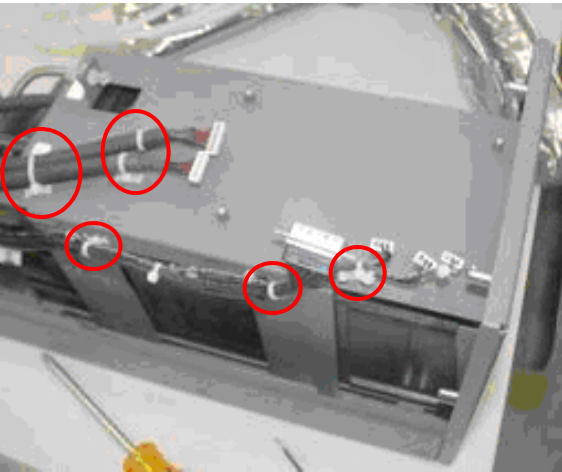

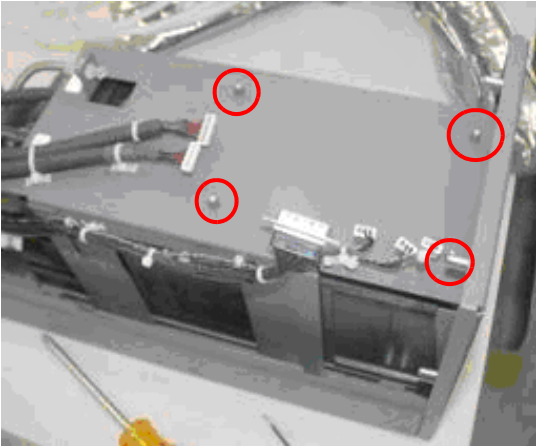
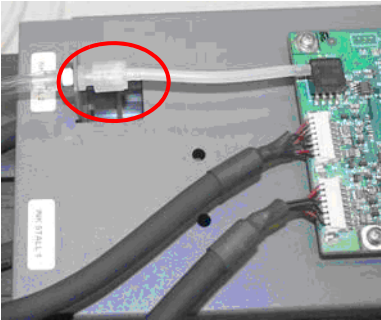
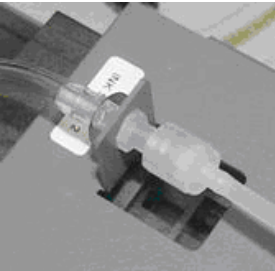
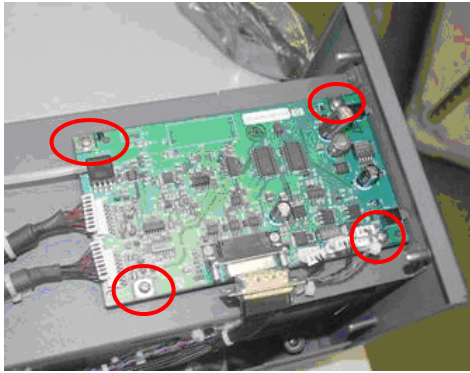
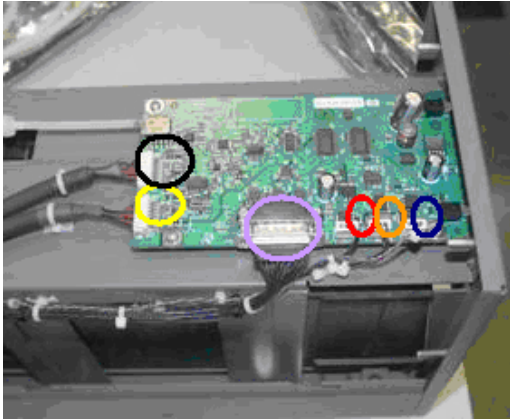
Illustration	Description
	Tie wrap the cables into position.
	Place the PILS PCA onto the top cover.
	Align the PCA with the four screw holes on the top cover.
	Screw the valve into the plastic fitting
	

Illustration	Description
	<p>Insert the four screws, but do not tighten them until <b>all</b> screws are inserted.</p>
	<p>Insert the cables into the PILS PCA.</p> <ul style="list-style-type: none"> <li><span style="color: red;">●</span> Valve 2</li> <li><span style="color: orange;">●</span> Valve 1</li> <li><span style="color: blue;">●</span> Air pump</li> <li><span style="color: yellow;">●</span> Ink stall 1</li> <li><span style="color: black;">●</span> Ink stall 2</li> <li><span style="color: purple;">●</span> IO cable</li> </ul>
<p><b>Replace the cover.</b></p>	

## Removal of Ink Tube Assembly and Crane

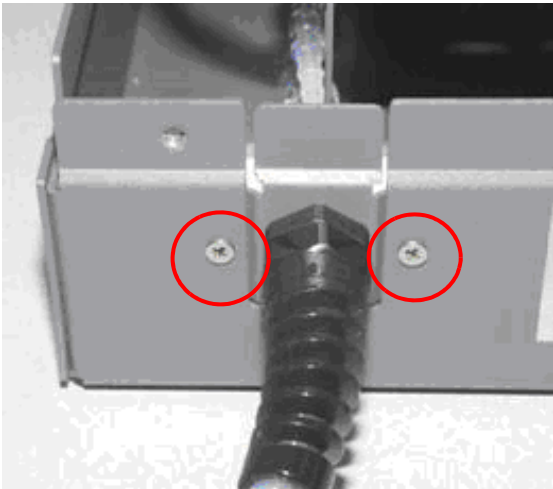
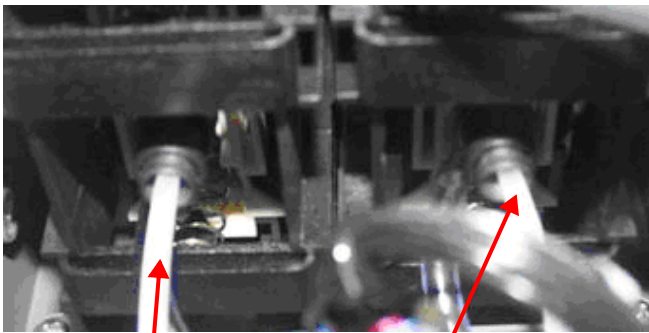
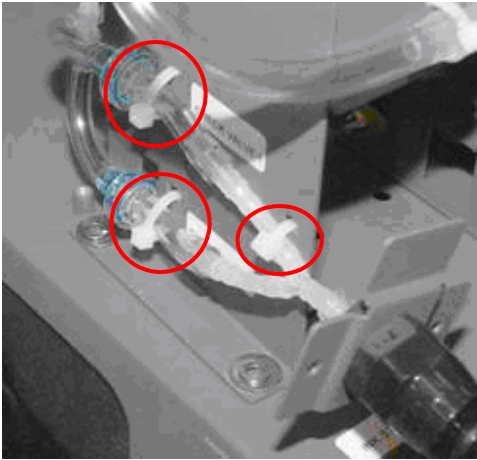
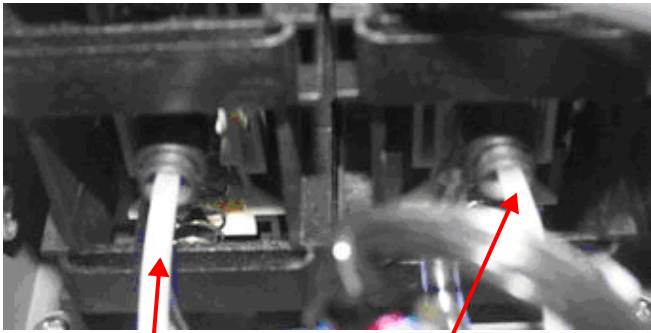
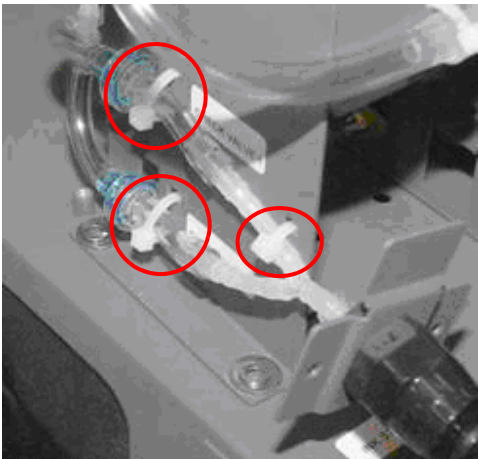
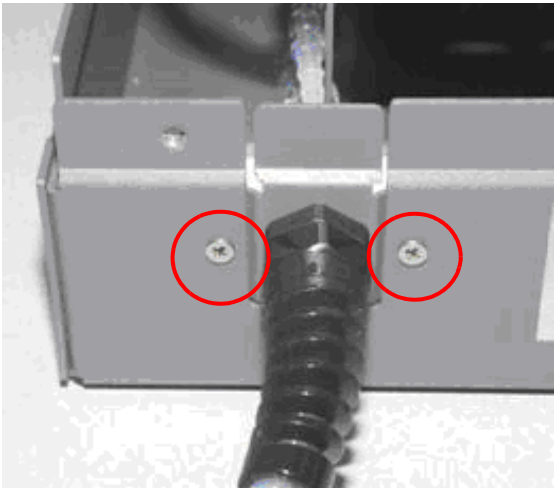
Illustration	Description
	<p><b>Remove the IDS Cover</b></p> <p>Be sure to handle and dispose of inks properly, per instructions in the <a href="#">Safety</a> chapter, page 13.</p> <p><b>CAUTION:</b> Avoid prolonged or repeated exposure, inhalation, and contact with skin and eyes. Wear lab coat, safety glasses, and latex gloves. Avoid direct contact with chemicals.</p>
	<p>Remove the two screws from the strain relief to release it from the IDS.</p>
 <p>Ink Tube 2</p> <p>Ink Tube 1</p>	<p>Remove each ink tube from the stalls by pushing the black retention fitting surrounding the end of the ink tube.</p>

Illustration	Description
	Cut the cable ties holding the ink check valves to the Pressure Control Module bracket.
(need photo)	Lift out the ink tubes from the IDS chassis; the complete Ink Tube Assembly, including the crane assembly and Imager Head mount strain relief bracket, is free at this point.

## Install Ink Tube Assembly and/or Crane

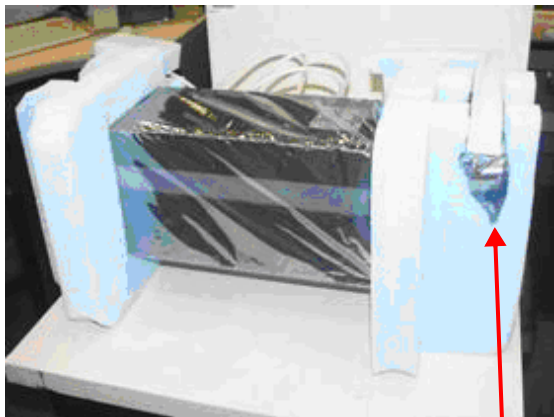
Illustration	Description
 <p><b>Ink Tube 2</b>      <b>Ink Tube 1</b></p>	<p>Place the Ink Tube Assembly into the chassis so that ink tube ends are near the stall installation positions and the check valves are near their mounting position on the pressure control bracket.</p> <p>Push in the end of the ink tube into its stall position by first pushing down on the black retention fitting and sliding the ink tube into the fitting.</p>
	<p>Fasten the ink check valves onto the pressure control module with cable ties. Do not over-tighten the cable ties, they should only be snug.</p>
	<p>Attach the ink tube retention bracket to the IDS chassis with two screws.</p>
<p><b>Replace the cover.</b></p>	

## Repackage the IDS

---

### Illustration

### Description



Crane

Place the IDS into an ESD bag, and tape the bag shut. Put foam on each side of the IDS.



Place the IDS into the box with the crane pointing towards the front of the box.



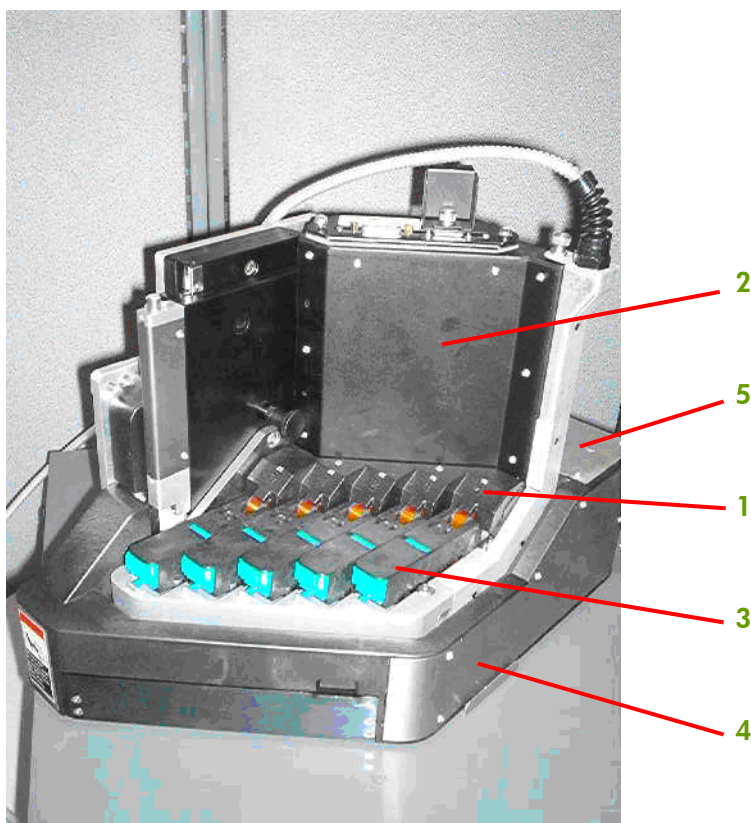
Seal the packaging box.

# Imaging Module Replaceable Parts

**Table 6-2** Imaging module replacement parts

item #	Service Part Number	Replacement Part/Assembly
1	Q2337-67019	OEM PCA Printhead Connect
2	Q2337-67003	OEM PCA Carriage
3	Q2326-67001	OEM Printhead Latch Assembly
4	Q2337-67011	OEM Service Station Assembly
5	Q2327-67004	OEM PCA Imager Servo

\* Parts may be hidden by covers in picture below.  
Numbers refer to the table above.





## Replacement Procedures

### Remove the Imaging Module from the Box

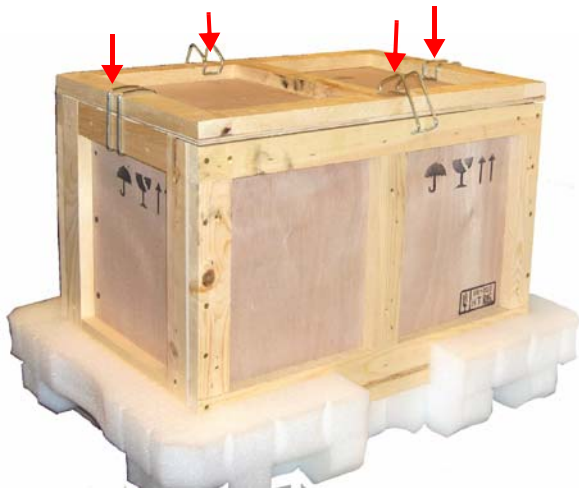
#### Illustration



#### Description

Remove the foam packing material around the lid of the wooden shipping crate.  
Turn the crate on its side and slide the crate out of cardboard box.

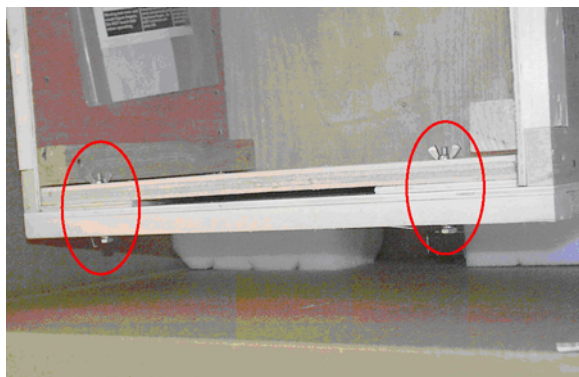
**NOTE:** Printheads should always be removed before servicing or shipping the imaging unit, or replacing the latches.  
Gloves should be worn.



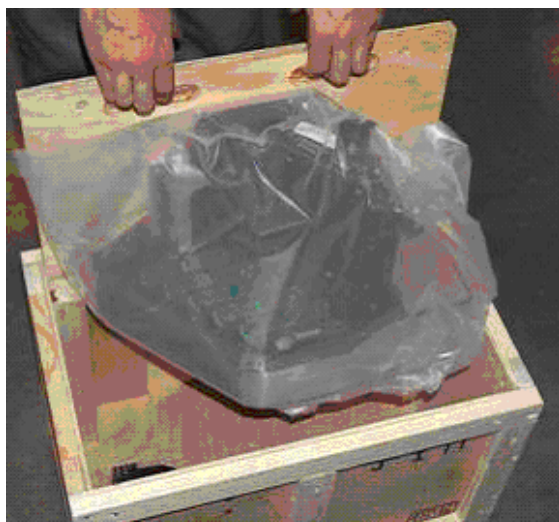
Remove the lid from the wooden shipping crate by removing the metal spring clips with a prybar or screwdriver.  
Set the lid and the clips aside to use later.



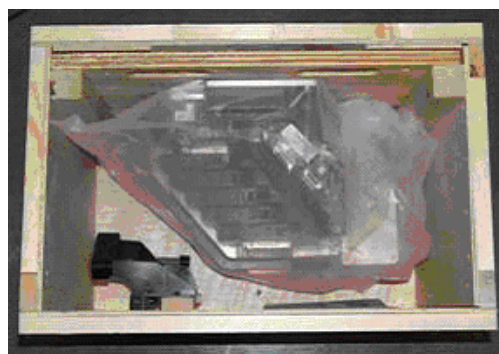


**Illustration****Description**

Remove two SCREW-CAP 1/4-20 2-1 LG HEX-HD from crate.



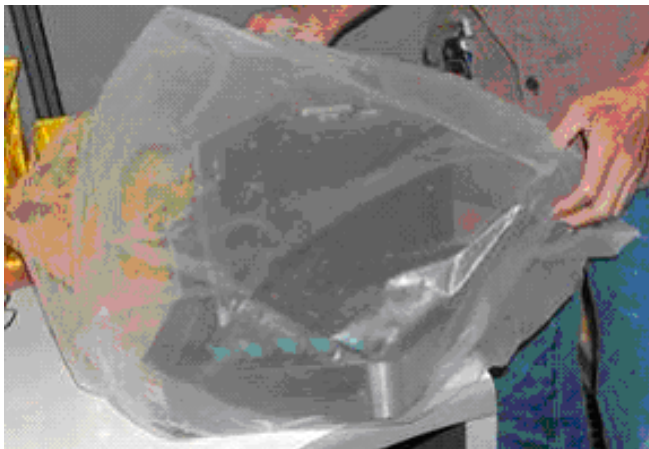
Remove the wood panel with the attached imager by lifting up and then place on a solid surface to remove four screws.



---

**Illustration****Description**

Remove the four M6x25 Phillips head screws from the wood panel.



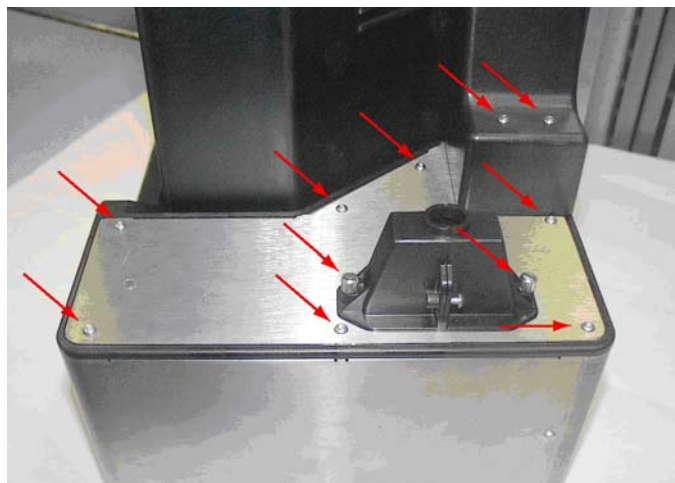
Remove desiccant and ESD bag from the Imager module.



Remove the detent pin from the slide.

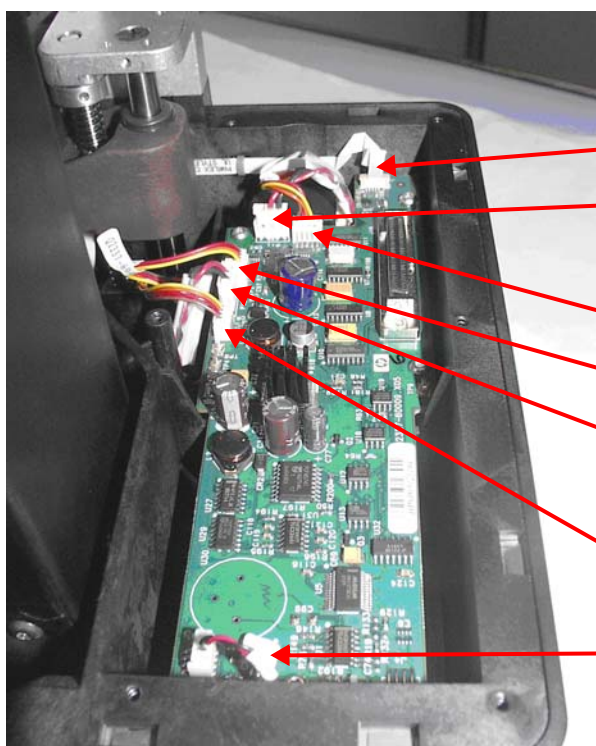
---

## Remove Servo PCA

**Illustration****Description**

Remove two M3x6 screws from the elevator cover.  
 Remove two screws from the connector boot.  
 Remove seven plastite screws from the Servo cover.

**CAUTION:** Wear an Electrostatic Device.  
 Static can cause an electrical short and cause the board to fail.



Unplug all the cables on the Servo PCA. Be sure to lift the lock tab of the Brick Present Cable connector before removing the cable, otherwise the cable may be damaged.

- 1 Brick Present Cable
- 2 Elevator motor power cable
- 3 Elevator motor control cable
- 4 SVS motor control cable
- 5 SVS motor power cable
- 6 Elevator home sensor
- 7 Door switch

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**Illustration**



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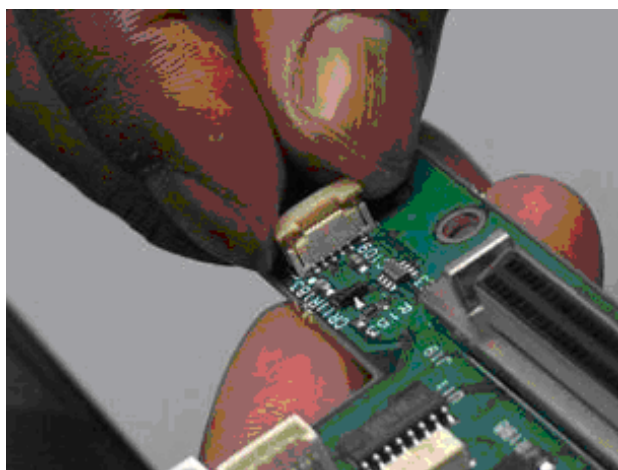
**Description**

Unscrew the four plastite screws from the PCA.

---

## Install Servo PCA

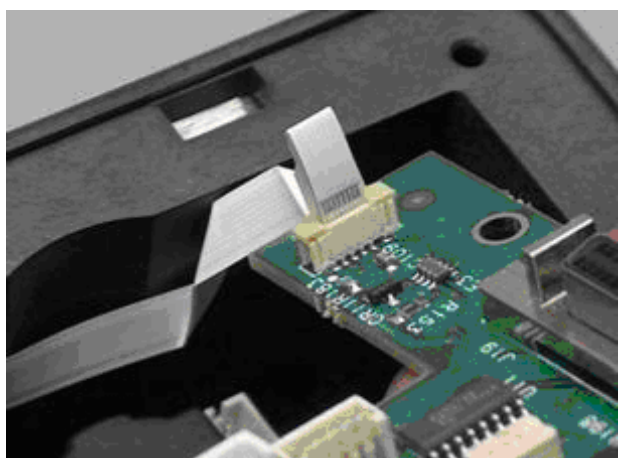
### Illustration



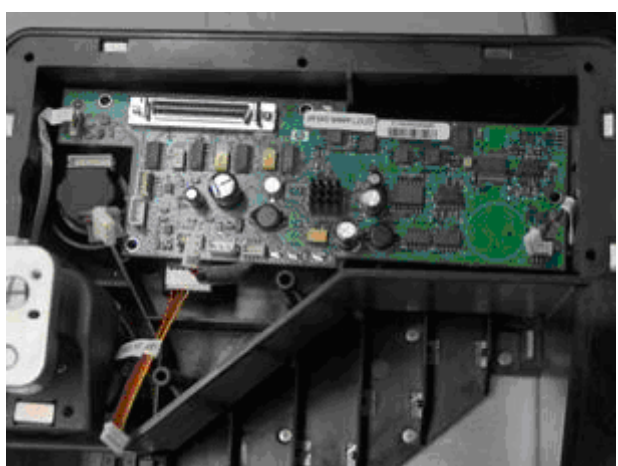
### Description

Take the new Servo PCA FFI out of the bag.

At the L-shaped cutout end of Servo PCA, lift the lock tab on the connector and insert the black-tipped portion of the cable brick present into the connector.



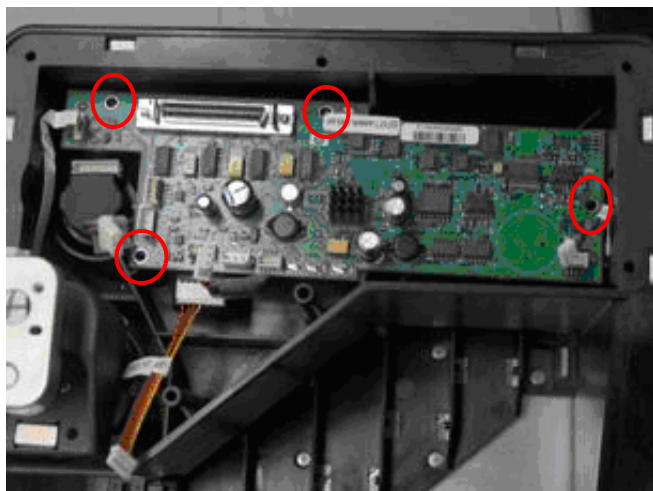
Push down on the lock tabs to secure the flex cable into the connector.



Insert the new Servo PCA FFI into the Service Station chassis.



## Illustration



## Description

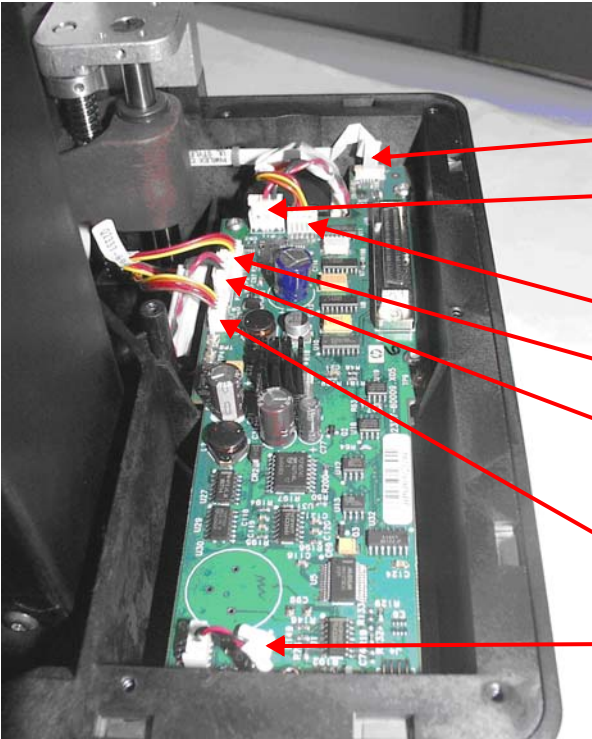
Insert and hand start four M3x8 plastite screws to secure the Servo PCA.

**CAUTION:** Do not tighten screws until **all four** are aligned and hand-started. Early screw tightening can result in damage to the circuits on the Servo PCA.



Tighten to torque value the hand-installed four M3x8 plastite screws from the previous step.

**NOTE:** Torque value: 3.6 in. lbs. (0.416 Newton metres)

Illustration	Description
	Attach all the cables to the connectors.
	1 Brick Present Cable
	2 Elevator motor power cable
	3 Elevator motor control cable
	4 SVS motor control cable
	5 SVS motor power cable
	6 Elevator home sensor
	7 Door switch

## Remove Service Station

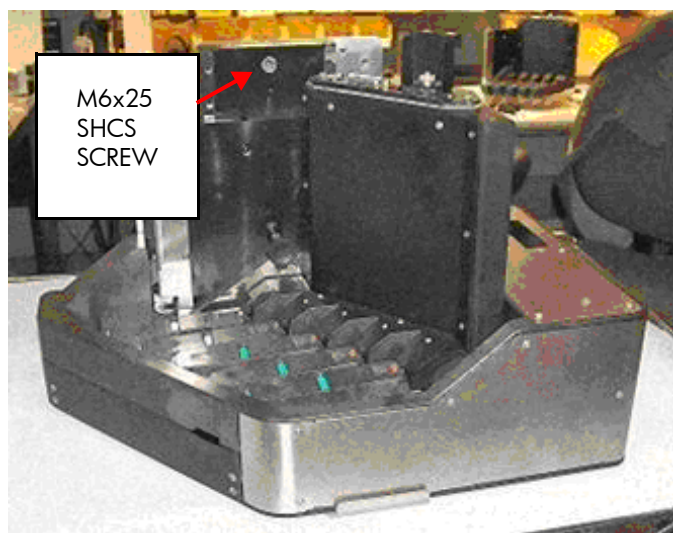
### Illustration

### Description



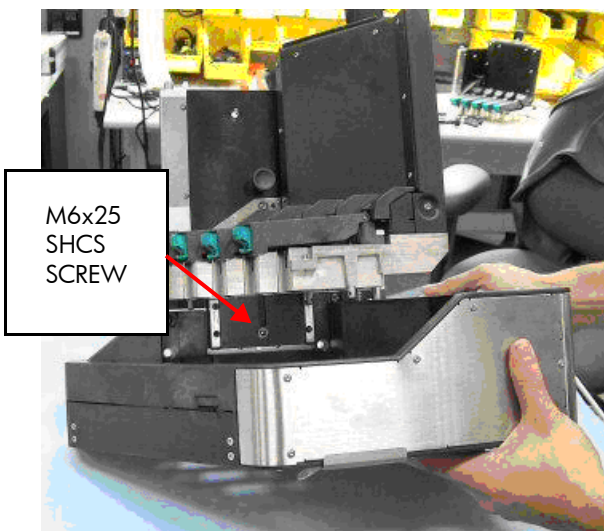
Remove two M3x6 screws (in yellow oval) from the elevator cover.

Remove two screws (circled in red) from the connector boot.

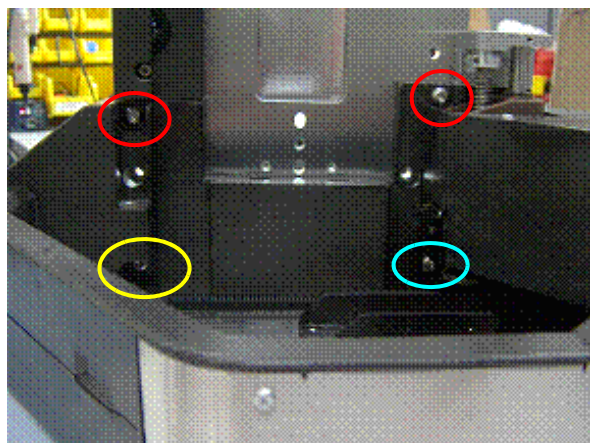


To remove the Imager Head, remove one M6x25 SHCS screw from the assembly Imager Head.



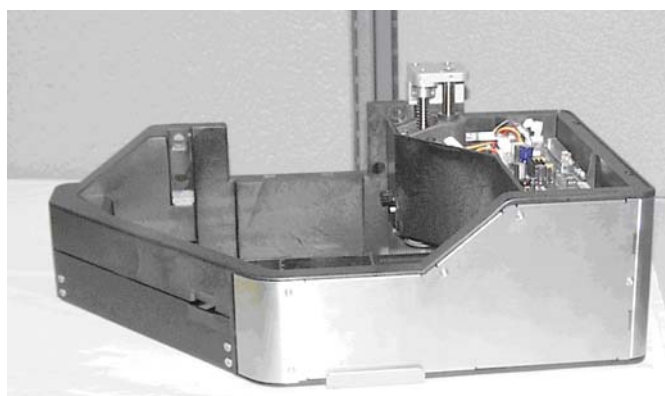
**Illustration****Description**

Lift the brick up and remove the second M6x25 SHCS screw from the assembly Imager Head.



Remove four M6x20 screws with an Allen wrench and long screwdriver to remove the assembly imaging mounting plate. The top two screws can be accessed with the long screwdriver.

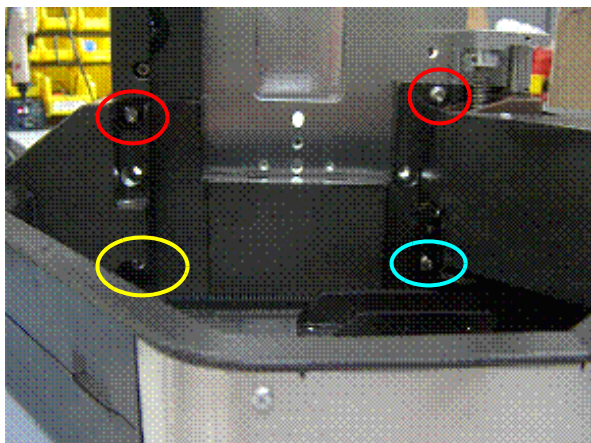
The screw circled in yellow can be accessed with the long screwdriver by opening the printhead cleaner access door. The screw circled in blue has to be removed using an Allen wrench.



Replace the Service Station with a new one.

## Install Service Station

### Illustration



### Description

Install the four M6x20 screws with an Allen wrench and long screwdriver to attach the assembly imaging mounting plate.

The top two screws can be installed with the long screwdriver.

The screw circled in yellow can be installed with the long screwdriver by opening the printhead cleaner access door.

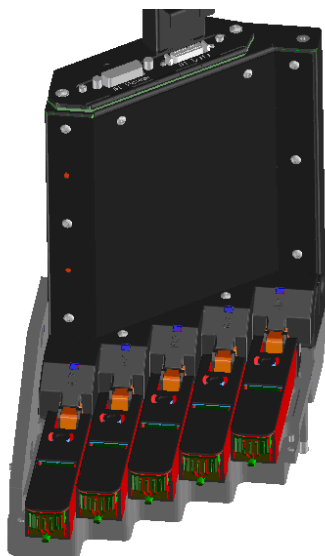
The screw circled in blue has to be installed using an Allen wrench.



Reinstall the elevator cover with the two screws.

## Remove Printhead Connect PCA

### Illustration



### Description

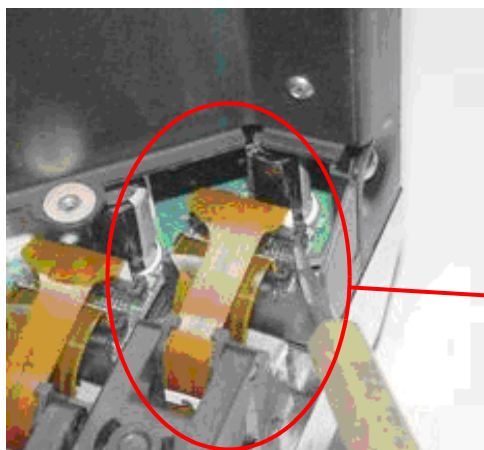
#### Before you begin:

Remove the elevator cover.

Remove the Carriage PCA per the procedure.

- 1 Remove two pan-head screws M3x10 from the electrical enclosure assembly.
- 2 Remove two BHCS M3x6 screws from the assembly flex cover to the socket array 5x1 assembly.

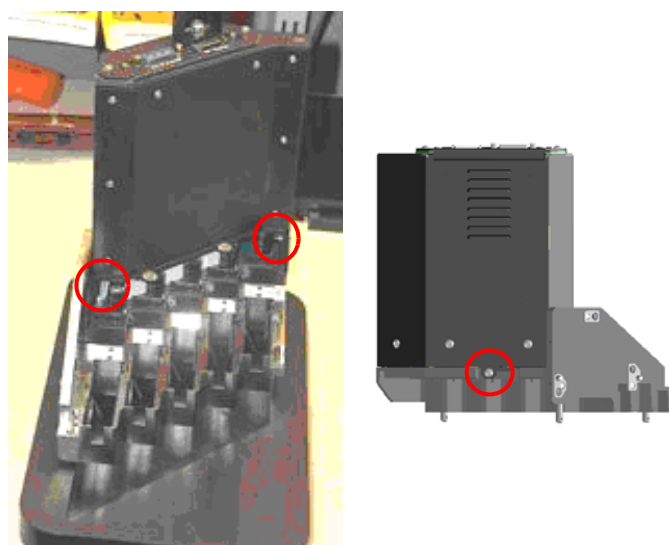
**NOTE:** Torque value: 3.6 in. lbs. (0.416 Newton metres)



Remove all the flex cables from the interconnect clamps.

**NOTE:** Be careful when lifting up connectors. They have a tendency to snap off if you lift too hard.

#### Interconnect Clamp



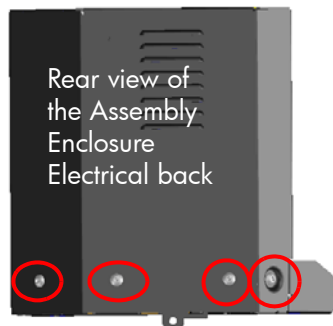
Remove three BHCS M4x8 screws (one in the back and two in front) to release the Enclosure from the socket array. (Note: do not remove pen socket array from slide assembly, this photo is shown for clarity.)

The Assembly can now be lifted off the socket array.

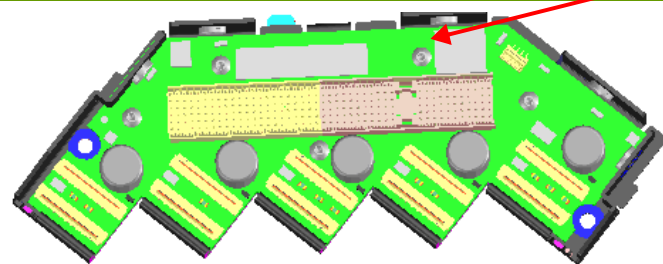
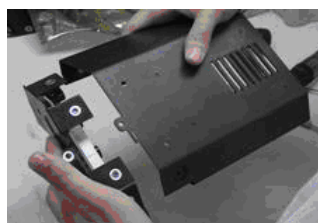
**NOTE:** Torque value: 8.4 in. lbs. (0.94 Newton metres)

## Illustration

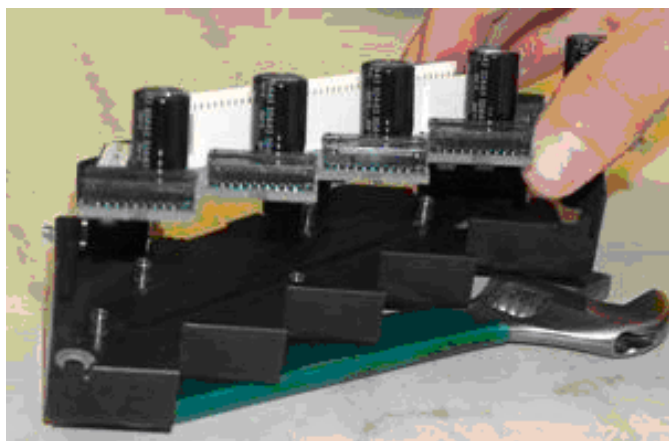
## Description



Remove the five BHCS M3x6 screws from the assembly base enclosure.



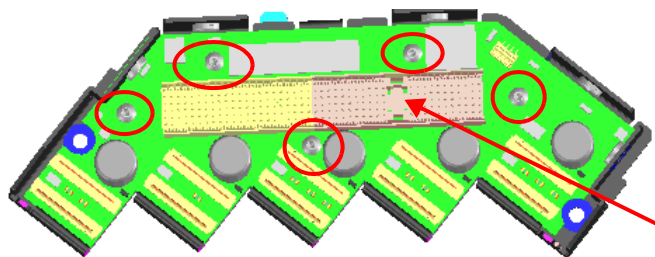
Be careful to inspect the PCA for bent pins.



Remove the Printhead Connect PCA from the base enclosure and replace with new one.

## Install Printhead Connect PCA

### Illustration



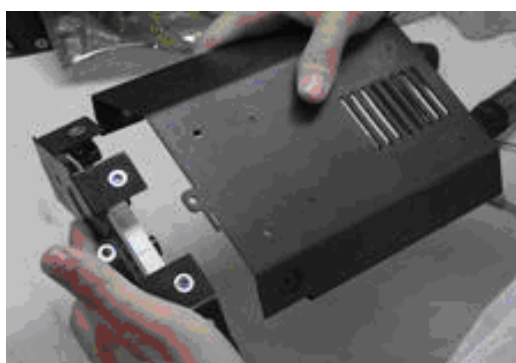
### Description

Insert and tighten only enough to start the threads and align the holes the five BHCS M3x6 screws, to secure the PCA Printhead Connect to the assembly base enclosure.

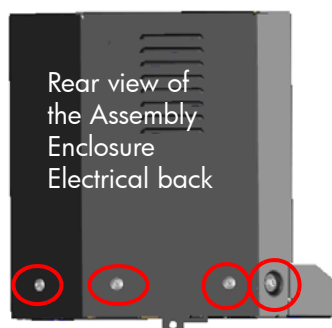
Tighten to torque value the five BHCS M3x6 screws.

Be careful to inspect the PCA for bent pins.

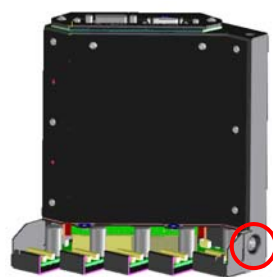
**NOTE:** Torque value: 3.6 in. lbs. (0.416 Newton metres)



Fit enclosure PCA base assembly onto the enclosure electric back assy.



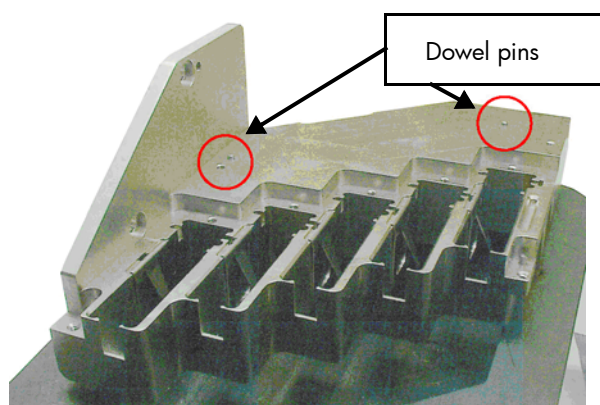
Rear view of  
the Assembly  
Enclosure  
Electrical back



Insert and tighten, only enough to start the threads and align the holes for the five BHCS M4x8 screws, to secure the Enclosure PCA assembly to the enclosure electric back assembly.

Tighten to torque value the five BHCS M4x8 screws.

**NOTE:** Torque value: 3.6 in. lbs.  
(0.416 Newton metres)

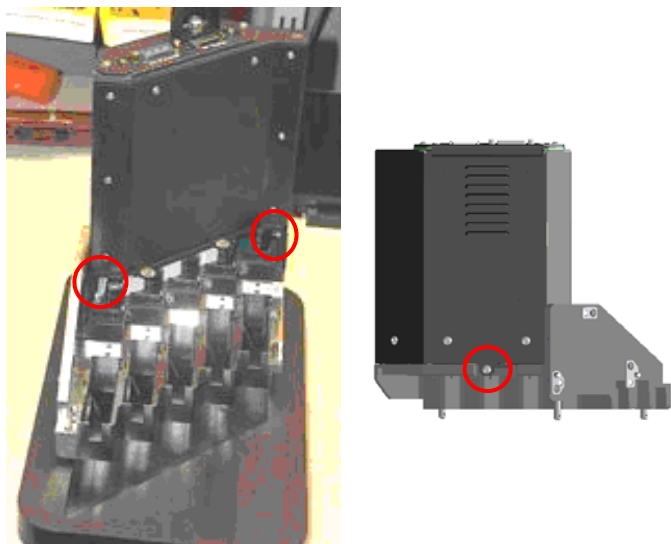


Dowel pins

Place enclosure on top of the socket array where the two dowel pins are.



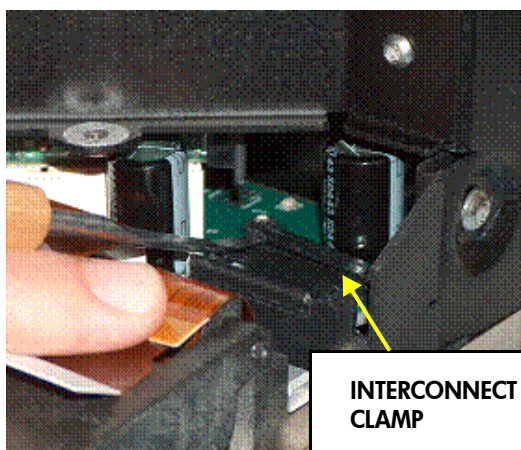


**Illustration****Description**

Insert the Electrical Enclosure assembly into the socket array 5x1 assembly.

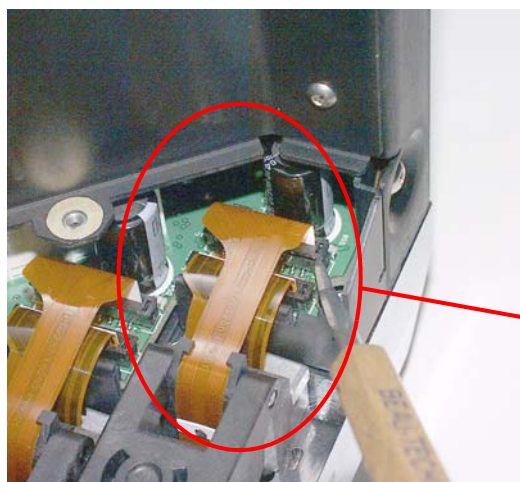
Insert and tighten to torque value three BHCS M4x8 screws (one in the back and two in front).

**NOTE:** Torque value: 8.4 in. lbs. (0.94 Newton metres)



Beginning at stall 0, use a universal tool to raise the interconnect clamp on the PCA printhead connect.

**CAUTION:** The cable connectors are thin, sensitive devices and break easily if not handled with care. Use a light touch to insert and seat each flex cable.



Install all assembly flex circuits into the corresponding interconnect clamp.

Close the interconnect clamps.

**NOTE:** Be careful when lifting up connectors. They have a tendency to snap off if you lift too hard.

**Interconnect  
Clamp**

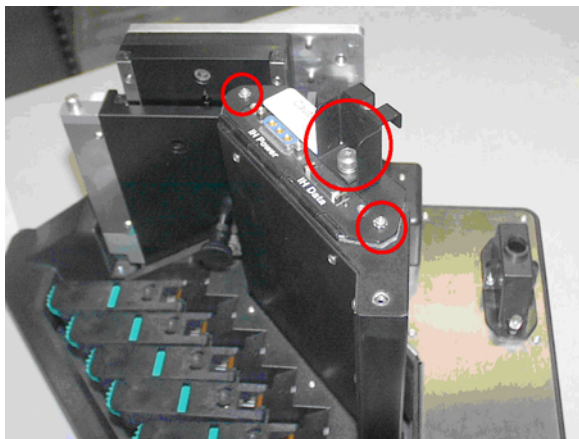


Illustration	Description
	Snap the flex cable cover onto the assembly socket array.
	Insert and tighten to torque value two BHCS M3x6 screws, to secure the assembly flex cover to the socket array 5x1 assembly.  <b>NOTE:</b> Torque value 3.6 in. lbs. (0.416 Newton metres)
	Insert Elevator cover over bearing block, and use two M3x6 screws.  <b>NOTE:</b> Torque value 3.6 in. lbs. (0.416 Newton metres)

## Replace Carriage PCA

### Illustration

### Description



**CAUTION:** Wear an ESD grounding strap when replacing the Carriage PCA. Static can cause an electrical short and cause the board to fail.

Remove two pan-head screws M3x10 from the Electrical Enclosure assembly.

**NOTE:** Torque value: 3.6 lb in. /lbs. (0.416 Newton metres).

Remove the Assembly Top Enclosure Strain Relief using a flathead screwdriver.



Lift up and pull the Assembly Top Enclosure to release from the Electrical Enclosure.

### PCA CARRIAGE FFI

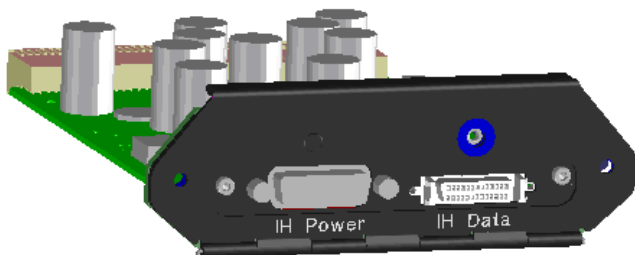
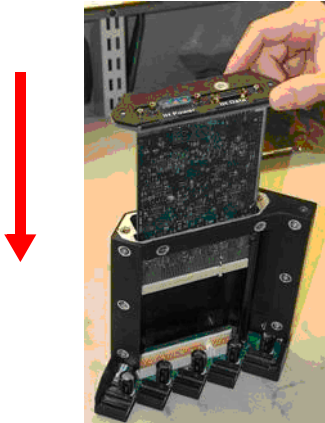


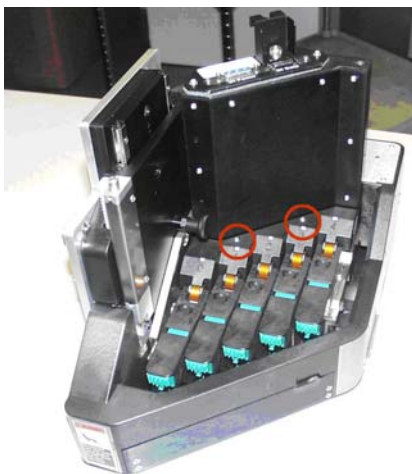




Illustration	Description
	<p>Verify that the connector tab on the base of the PCA carriage FFI faces the printheads.</p> <p>Slide the PCA carriage FFI into the enclosure electric back assembly, assure that the PCA is in the guide rails.</p> <p>Gently press the PCA carriage FFI down until it is fully seated in the enclosure PCA base assy.</p>
	<p>Insert and tighten to torque two pan-head screws M3x10 to secure the Electrical Enclosure assembly.</p> <p><b>NOTE:</b> Torque value: 3.6 lb in. /lbs. (0.416 Newton metres).</p>
 	<p>Install top enclosure strain relief assembly, and hand-tighten the pre-installed thumb screw.</p>

## Remove Printhead Latch Assembly

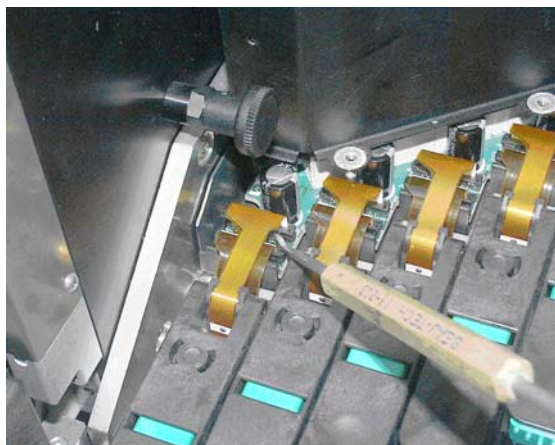
### Illustration



### Description

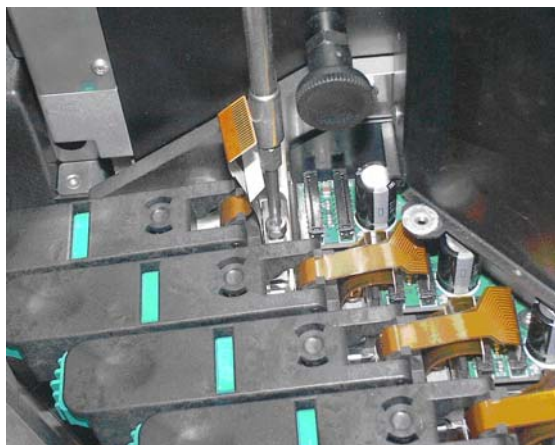
Remove two BHCS M3x6 screws connecting the assembly flex cover to the socket array 5x1 assembly.

**NOTE:** Torque value: 3.6 lb in. /lbs. (0.416 Newton metres).



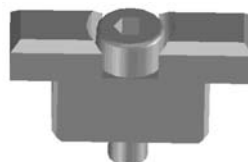
Remove flex cable by using a universal tool to raise the interconnect clamp on the PCA printhead.

**CAUTION:** The cable connectors are thin, sensitive devices and break easily if not handled with care. Use a light touch to insert and seat each flex cable.



Remove one SHCS M4x12 screw from the frame retainer gimble.

**NOTE:** Torque value 8.4 in. lbs. (0.94 Newton metres).



FRAME RETAINER GIMBLE  
WITH SHCS M4X12

---

**Illustration**

---

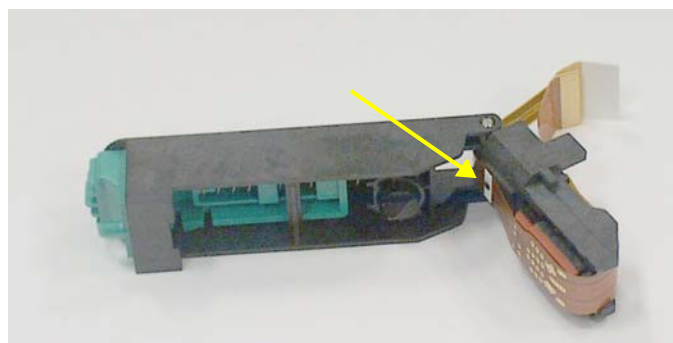
**Description**

Remove latch assembly and replace with new one.

---

## Install Printhead Latch Assembly

### Illustration



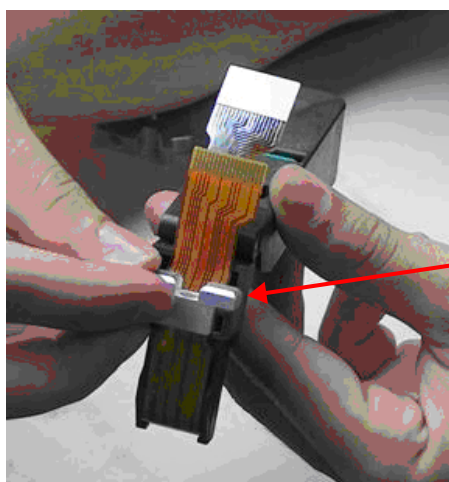
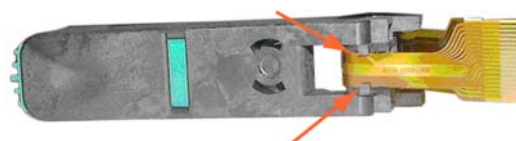
### Description

Before installing the new latch assembly, check for defects or assembly errors.

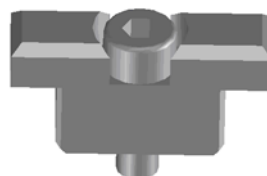
Make sure the tab is heat staked correctly.

Make sure flex cable is between these two grooves.

Place latch assembly into the brick and assemble unit.



Insert and tighten to torque value one SHCS M4x12 screw to secure the frame retainer gimble into the assembly socket array 5x1.

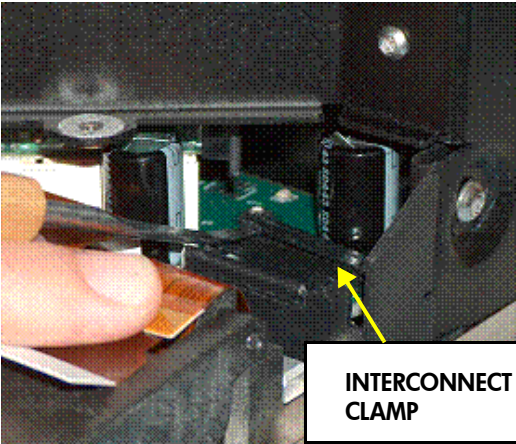
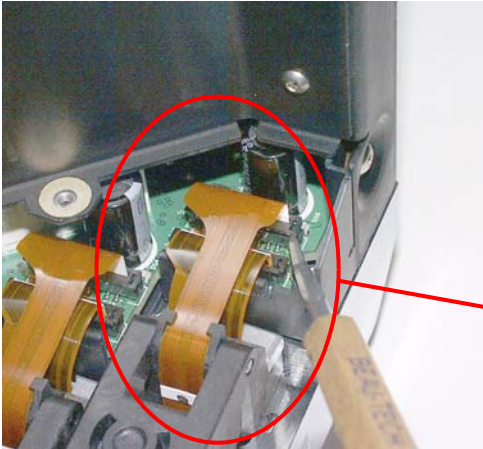



FRAME RETAINER GIMBLE  
WITH SHCS M4X12

**NOTE:** Torque value 8.4 in. lbs. (0.94 Newton metres).



Slide the latch assembly into position and tighten the screw.

Illustration	Description
 <p data-bbox="488 625 659 682"><b>INTERCONNECT CLAMP</b></p>	<p data-bbox="837 262 1465 315">Use a universal tool to raise the interconnect clamp on the PCA printhead connect.</p> <p data-bbox="837 363 1465 447"><b>CAUTION:</b> The cable connectors are thin, sensitive devices and break easily if not handled with care. Use a light touch to insert and seat each flex cable.</p>
	<p data-bbox="837 751 1465 804">Install all assembly flex circuits into the corresponding interconnect clamp.</p> <p data-bbox="837 814 1150 842">Close the interconnect clamps.</p> <p data-bbox="837 890 1465 947"><b>NOTE:</b> Be careful when lifting up connectors. They have a tendency to snap off if you lift too hard.</p>
<p data-bbox="850 1171 991 1228"><b>Interconnect Clamp</b></p>	

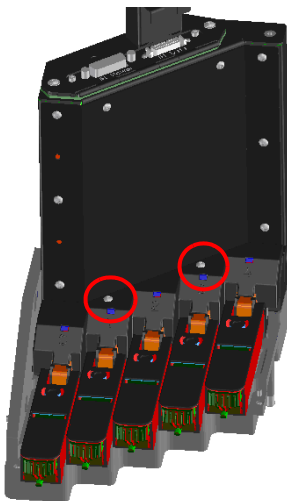
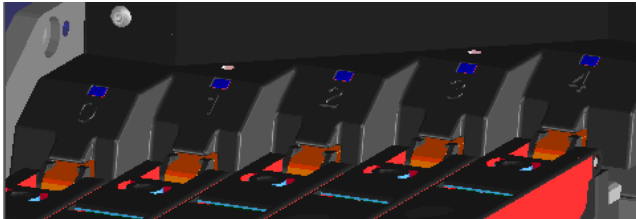
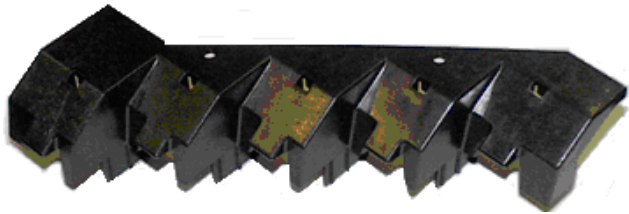
---

**Illustration**

---

**Description**

Snap the flex cable cover onto the assembly socket array.



Insert and tighten to torque value two BHCS M3x6 screws to secure the assembly flex cover to the socket array 5x1 assembly.

---

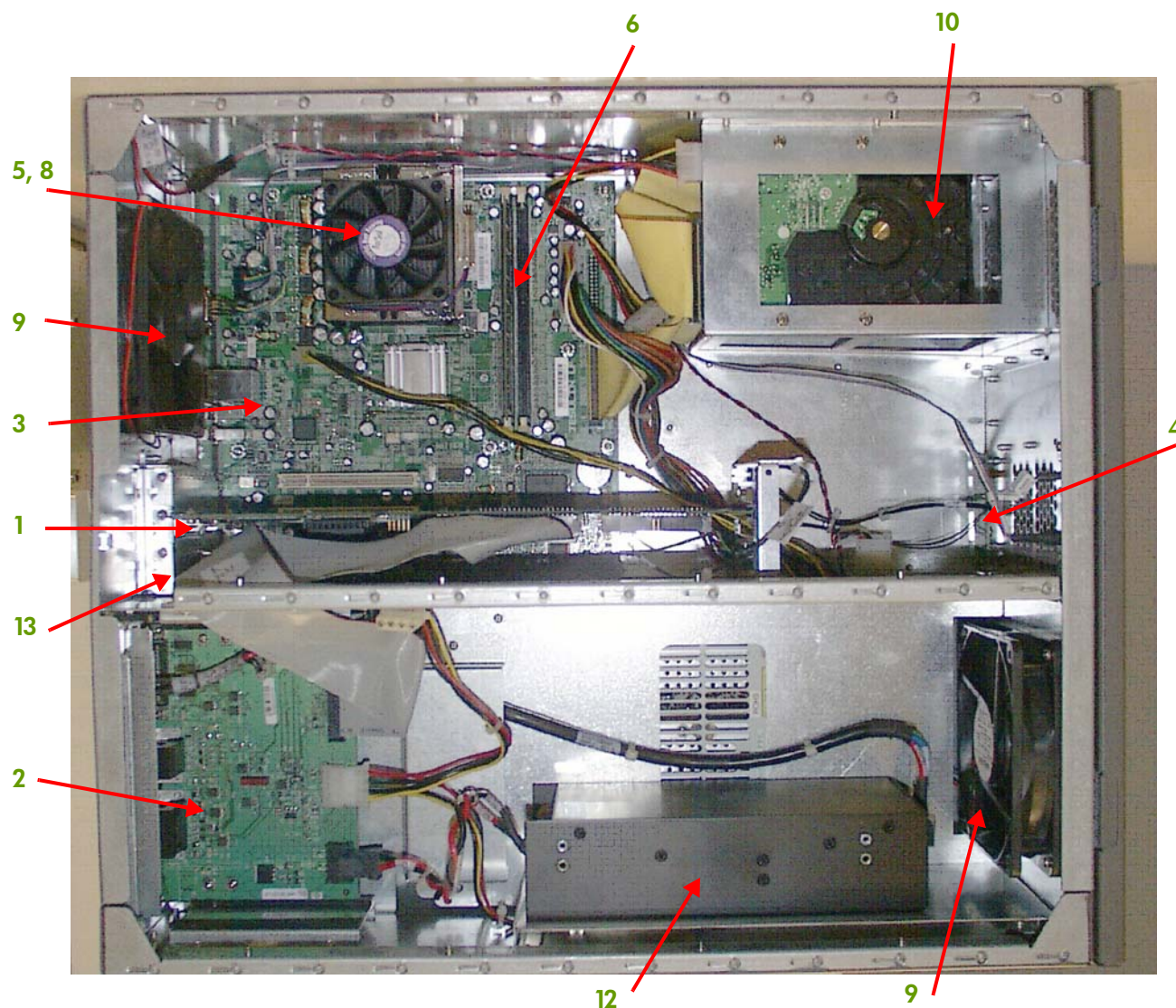
**NOTE:** Torque value 3.6 in. lbs. (0.416 Newton metres).

---



# Imager Controller Replaceable Parts

Numbers in the picture below refer to the table following.



**Table 6-3** Imager Controller replaceable parts

Item #	Service Part Number	Replacement Part/Assembly
1	Q2327-67001	OEM PCA Engine
2	Q2327-67002	OEM PCA Interconnect
3	Q2327-67006	OEM PCA Formatter
4	Q2327-67007	OEM PCA LED Front Panel
5	Q2326-67008	OEM Celeron CPU

**Table 6-3** Imager Controller replaceable parts

Item #	Service Part Number	Replacement Part/Assembly
6	Q2326-67009	OEM DDR333 PC Memory
7	Q2337-67001	OEM Controller Filter
8	Q2337-67022	OEM CPU Fan
9	Q2337-67002	OEM Controller Fan
10	Q2326-67010	OEM Hard Disk Drive
11	Q2326-67012	OEM ATX Power Supply
12	Q2326-67013	OEM 24V Power Supply
13	Q2337-67014	OEM Giga Bit Card

The table below identifies where the controller internal cables terminate. The PCA and the appropriate reference designator is given, or a description of the termination location.

Cables are routed from the digital compartment that contains the formatter PCA, to the power compartment, via openings in the partition between the compartments. There is one opening near the Interconnect PCA, and the other is near the LED PCA on the other end of the partition.



**NOTE:** HP does not provide replacement cable ties.

**Table 6-4** Imager Controller internal cables

Part	Part Number	Where Used	From	To
Cable, Power / Reset	Q2337-67003	Q7473A & Q7473L	Formatter PCA	Rear panel RS-232 connector & front soft power / reset buttons
Cable, INC -Rear Panel	Q2337-67004	Q7473A & Q7473L	INTC PAC	INTC Rear Panel
Cable, AC Input	Q2337-67005	Q7473A & Q7473L	Main AC Power	ATX, Ground Lug, Power Inlet, Power Strip
Cable, AC Terminal block to 24VDC	Q2337-67006	Q7473A & Q7473L	Power Strip	24 Power Supply
Cable, Engine/ MB Control	Q2337-67007	Q7473A & Q7473L	Engine PCA	Formatter PCA
Cable, DC Output to INTC	Q2337-67009	Q7473A & Q7473L	INTC PCA connector P11	24V Power Supply
Cable, Engine to INTC	Q2337-67010	Q7473A & Q7473L	INTC PCA	Engine PCA



**Table 6-4** Imager Controller internal cables

Part	Part Number	Where Used	From	To
Cable, Fan to Power Supply	Q2337-67017	Q7473A & Q7473L	ATX	Fans

# Replacement Procedures

Use the following procedures to remove and replace the replaceable parts.

## EE Box Parts Replacement

### Illustration

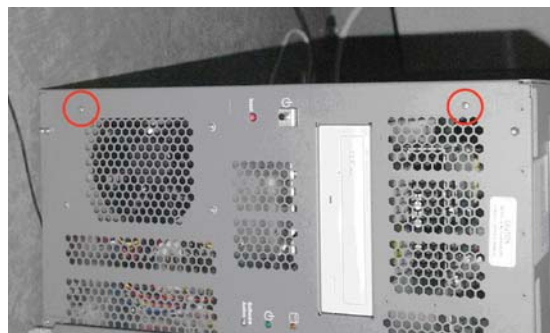
### Description



### Remove & Install Fan Filter

Open the door on the Imager Controller and lift the filter out to replace it.

Tuck new filter into the retention features on the perimeter of the door. Verify that the filter is on, blocking the LED light pipes.



### Remove Controller Cover

Remove two screws from both sides of the panel.

Use a flat-head screwdriver to wedge the panel forward and remove.



---

**Illustration****Description**

---

## Install Controller Cover

Place cover over chassis while allowing the cover locking features to slide over the retention pins.

Push the cover so the flange is flush with the chassis.

Install the two retention screws

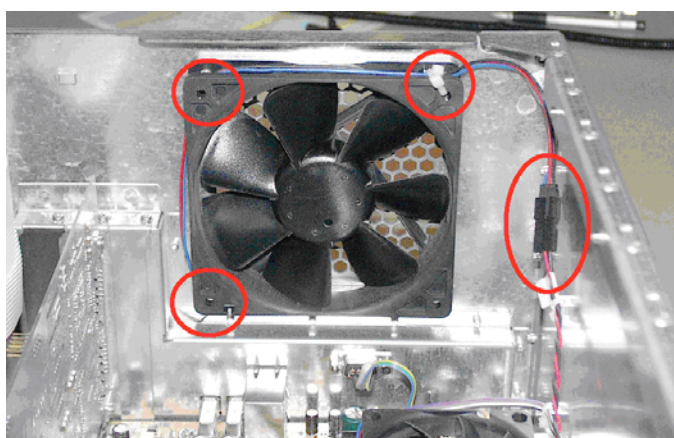


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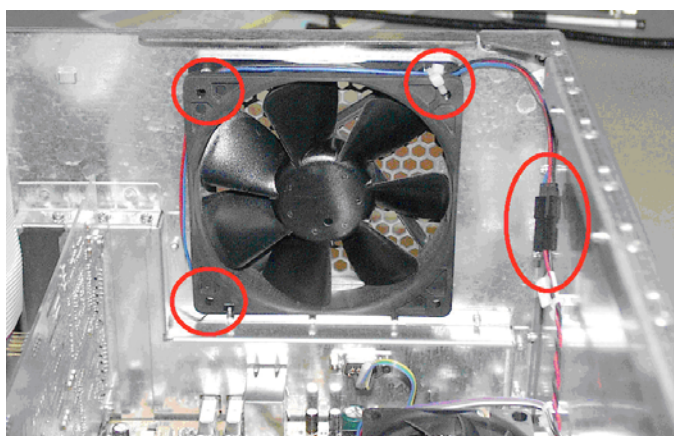
## Remove Rear Fan

**Before you Begin:**

Remove Controller Cover



Remove three screws and unplug the fan cable.  
The fan can now be lifted out.



---

## Install Rear Fan

Place fan over the screw hole positions.

Install the three screws removed from defective fan.

Connect the fan cable as shown.

Reinstall controller cover.

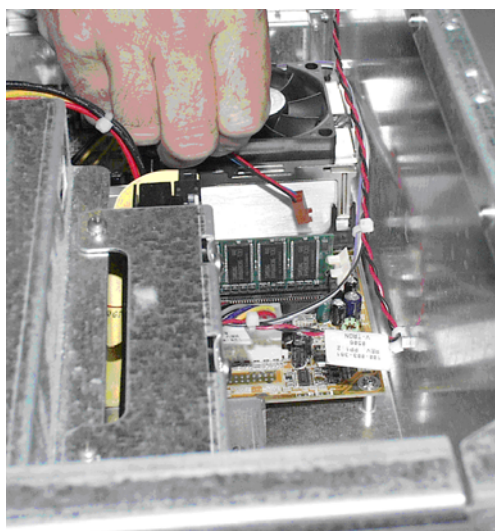
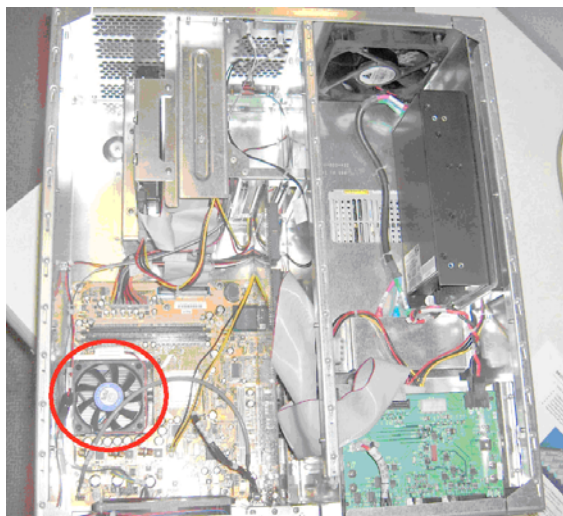
---

**Illustration**

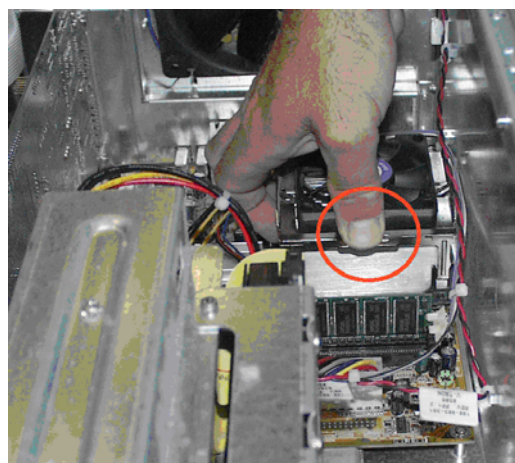
**Description**

---

## Remove Microprocessor Fan



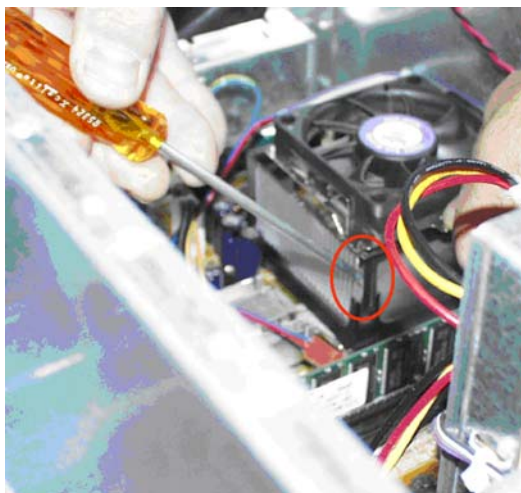
Unplug the fan from the formatter board.



Press down on metal tab to release the mounting bracket to remove the fan.



---

**Illustration****Description**

Press tabs in on all four sides to help release the bracket retention hooks.



Remove a total of four screws from each side to release fan from the bracket.



---

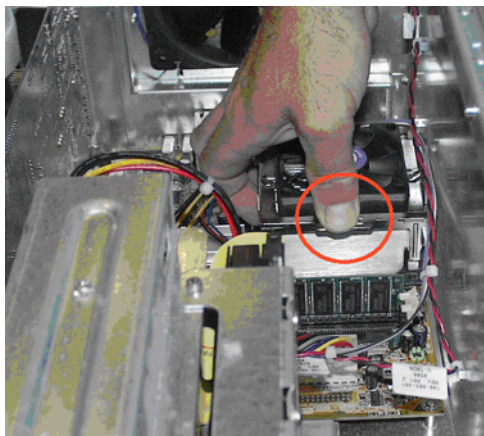
## Install Microprocessor Fan

Place the microprocessor fan on the fan bracket and install all four screws to fasten the fan onto the bracket.

---

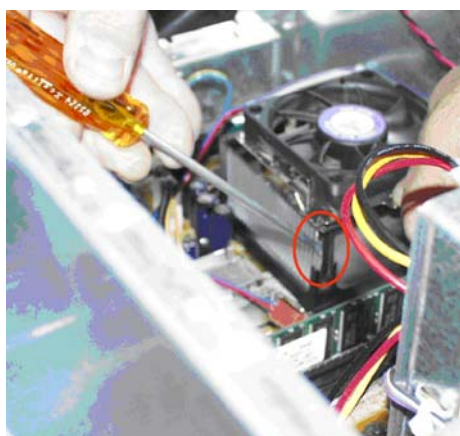
**Illustration**

---

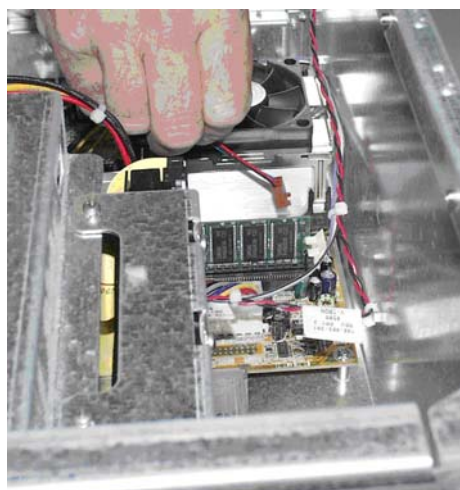
**Description**

Place the fan and bracket with its retention hooks over the microprocessor heat sink.

Press on the bracket so the each of the hooks on the retention legs engages the bracket that surrounds the microprocessor.



Verify that each leg is hooked into position.

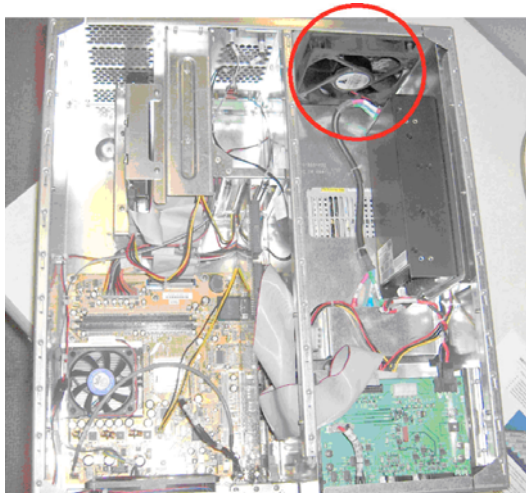


Reconnect the fan cable and dress it around the fan.

---

**Illustration**

---

**Description**

## Remove Front Fan



Remove cables from the Interconnect board.

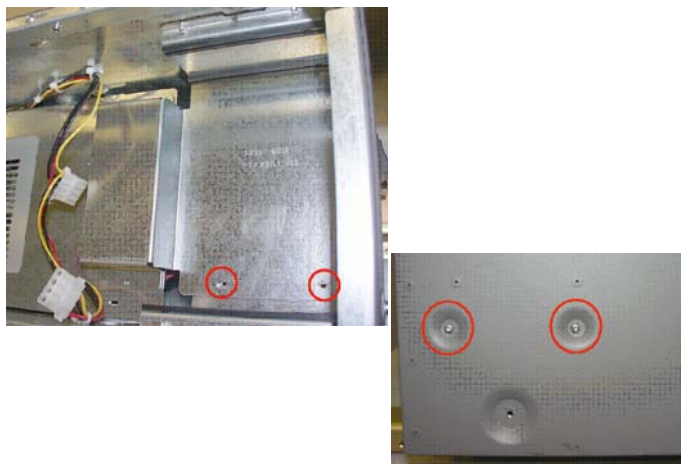


Remove two screws from the Interconnect PCA assembly to pull the card out.

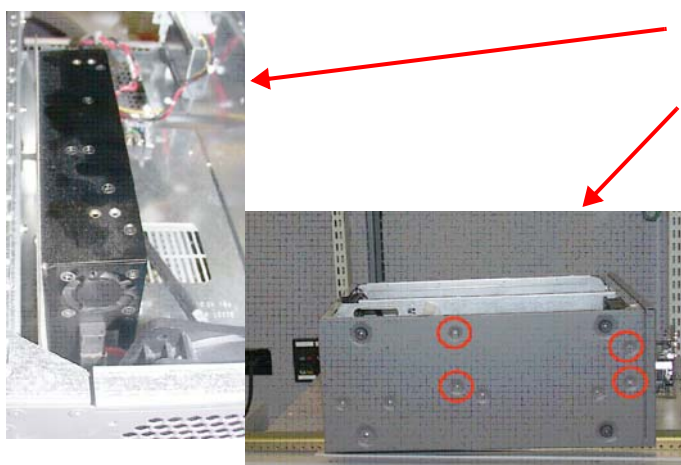


## Illustration

## Description

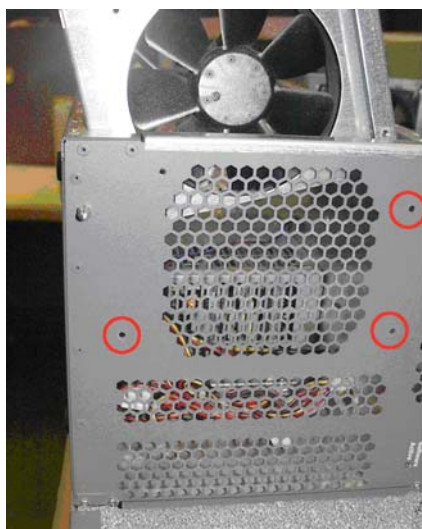


Remove AC power cover by unscrewing a total of four screws.

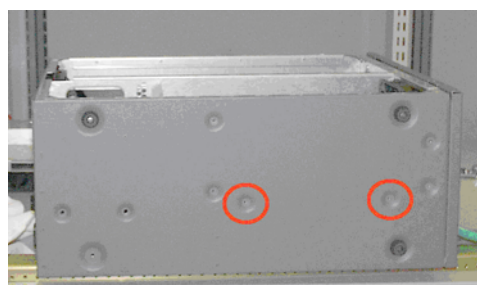


Remove the Aux PSU AC - DC, 24V power supply with its mounting bracket.

Remove four screws from the outside of the Controller to release the power supply.

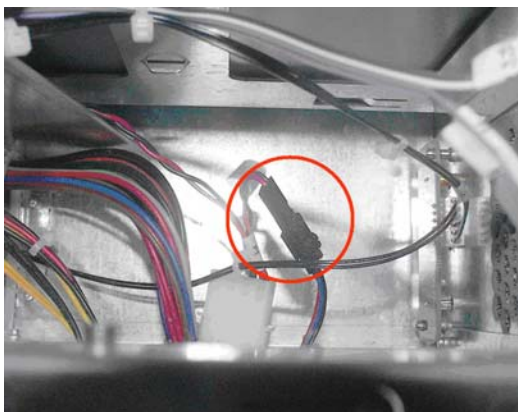


Remove three screws from the front of the Controller and two screws from the chassis side to release the fan/plenum assembly.

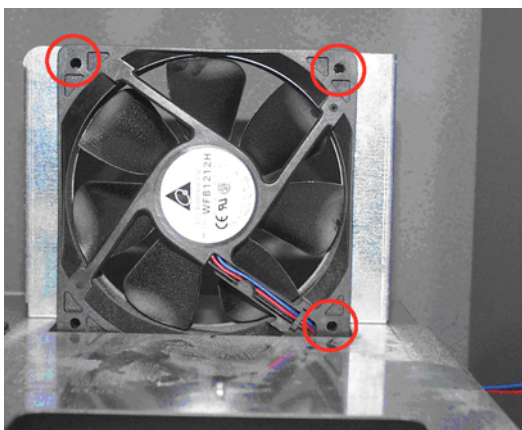




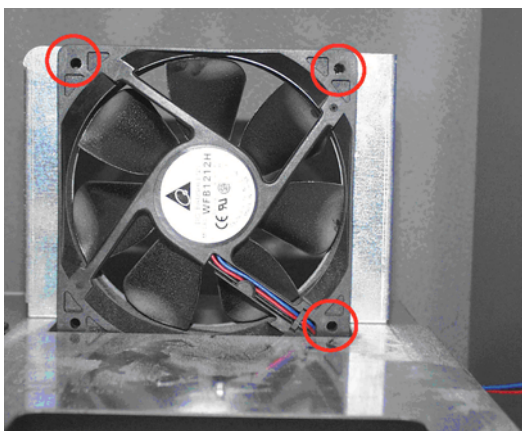
---

**Illustration****Description**

Unplug connector to remove fan from the Controller.



Remove three screws to release the fan from the plenum bracket piece



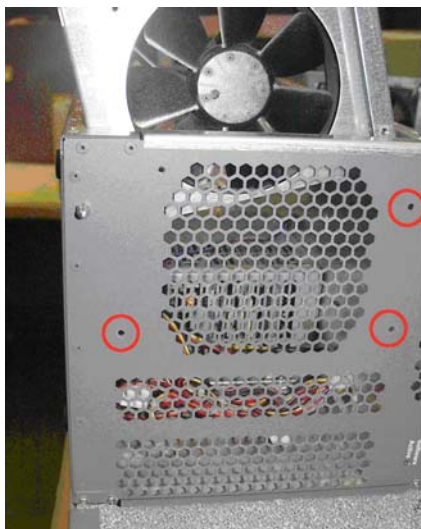
## Install Front Fan

Install the new fan onto the plenum bracket using three screws.

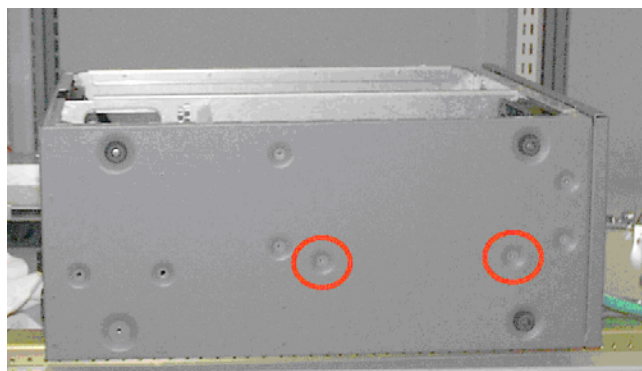
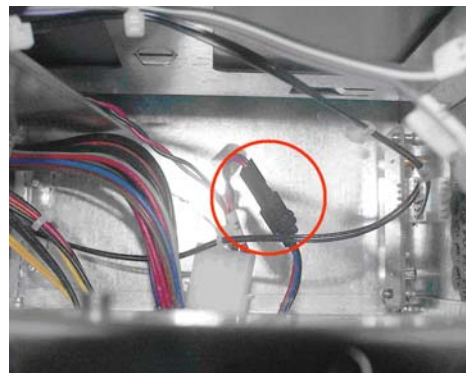
---

**Illustration**

**Description**



Start installing the fan/plenum bracket assembly, but before it is completely in, connect the fan cable to its power receptacle.

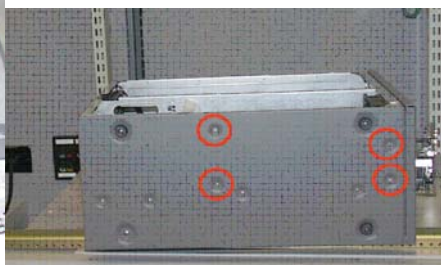


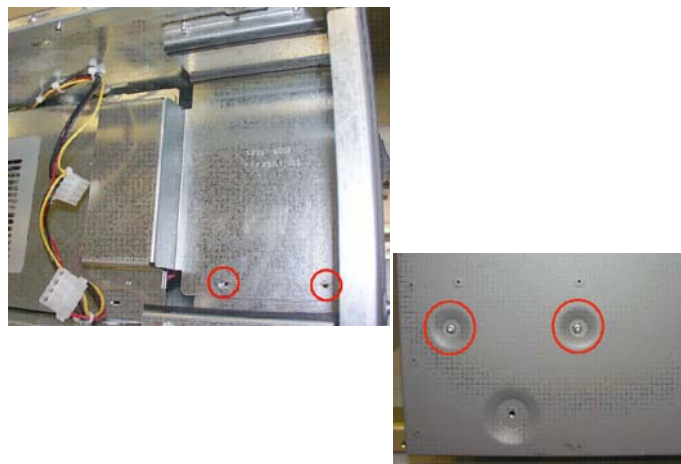
Install the plenum fasteners from the outside of the chassis.



Install the 24VDC power supply with its mounting bracket onto the chassis wall with the four screws.

Replace any cable ties that have been removed.

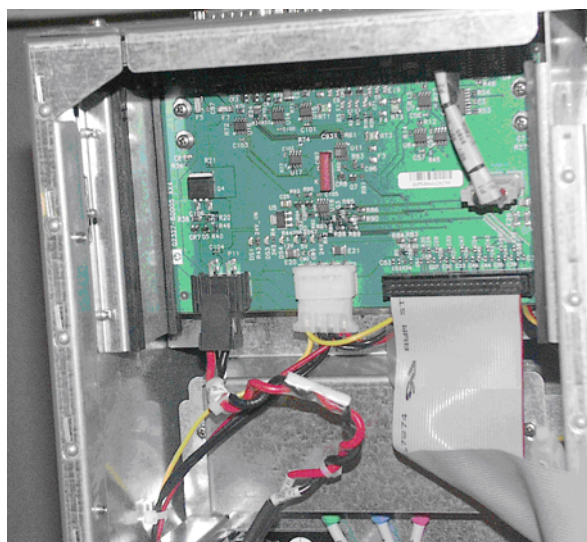


**Illustration****Description**

Install the AC power cover as shown.



Reinstall the Interconnect PCA assembly with the two screws.



Re-connect all the cables to the Interconnect PCA assembly.

## Remove Microprocessor (CPU)

### Before you begin:

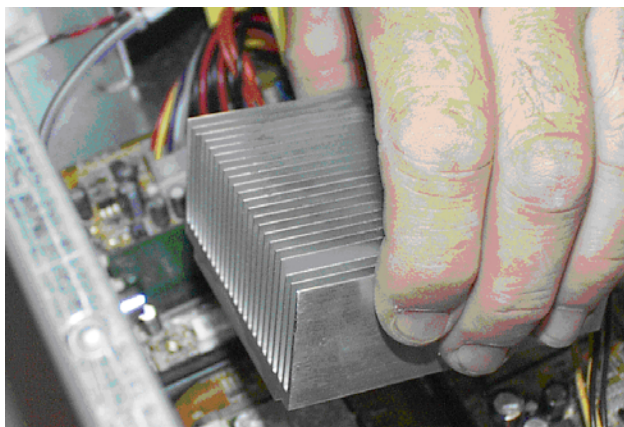
Remove the microprocessor (CPU) fan and bracket.



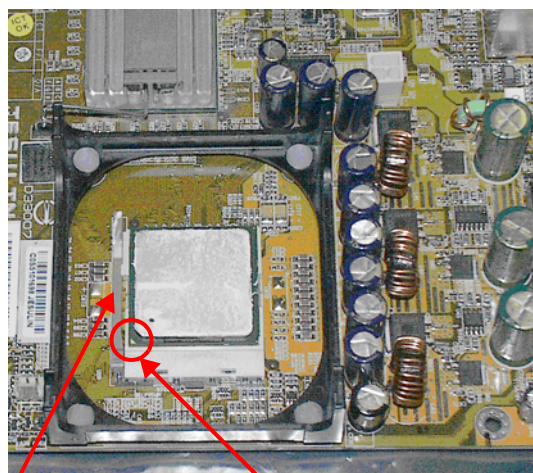
---

**Illustration**

**Description**



Remove the heat sink from the formatter board to access the CPU.

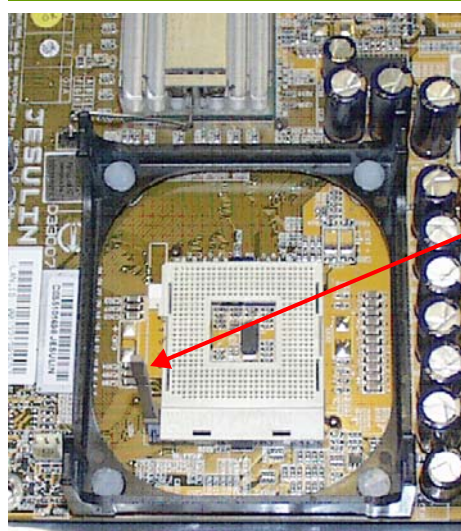


Handle

Reference Marker

Remove CPU by lifting up the lever (handle) to release the microprocessor from the formatter board socket.

Note the location of the microprocessor reference marker.



Handle (raised)

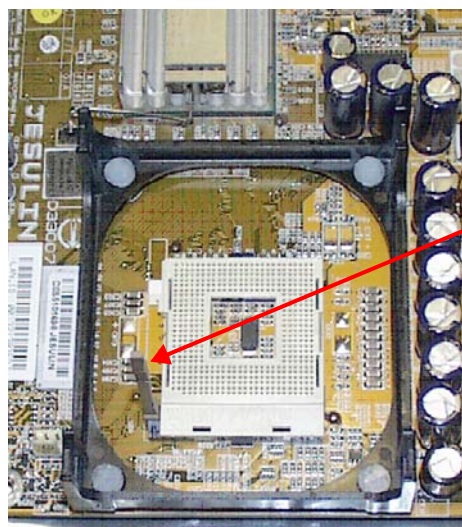
This is the CPU socket with the Microprocessor removed. Note the lifted handle (lever).

**Illustration****Description**

## Install Microprocessor (CPU)

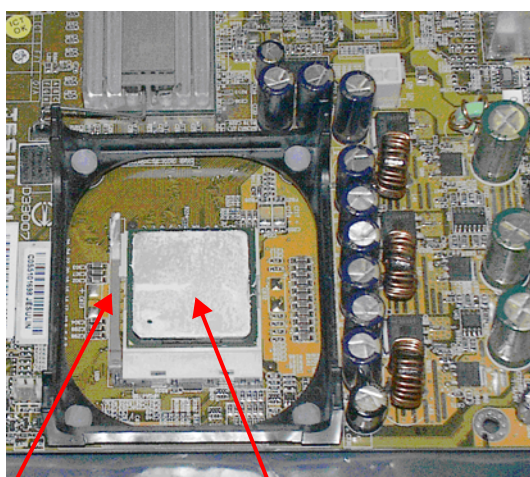
**Before you begin:**

Assure that there is sufficient conduction grease on the microprocessor. There should a thin, uniform layer of conductive grease.



Handle (raised)

This is the CPU socket with the Microprocessor removed. Note the lifted handle (lever).



Handle down and  
locked

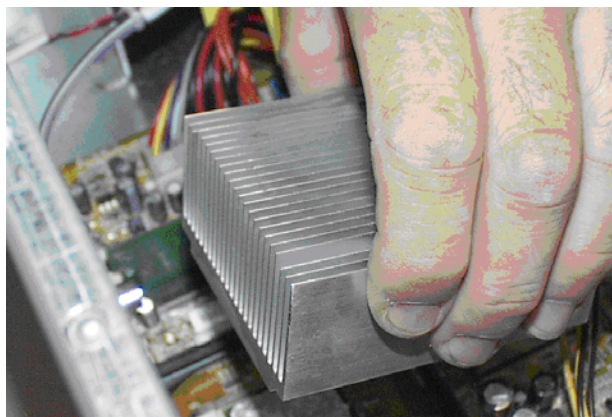
CPU Installed

Align the microprocessor with the reference marker, install the processor into position and lock it down by moving the lever down into its locked position.

---

**Illustration**

---

**Description**

Re install the heat sink onto the microprocessor. Verify that no conductive grease has been squeezed out; wipe off any excess.

Reinstall the microprocessor fan and bracket.



---

## Remove Engine PCA



Unscrew one screw to release Engine Board from mounting bracket.



**Illustration****Description**

Lift the PCA up from its position.

Unplug the LED cable and Ribbon cable to remove engine board.

**Install Engine PCA**

Connect the LED cable and Ribbon cable to the engine PCA.

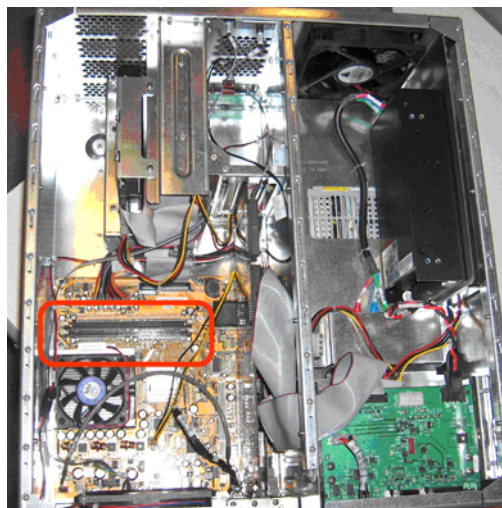


Slide the PCA down so that the PCA mounting bracket is engaging the chassis correctly and PCA engages the mating connector on the Formatter PCA.

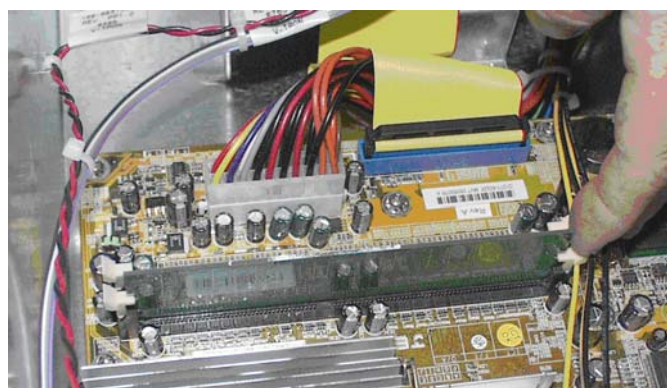
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**Illustration**

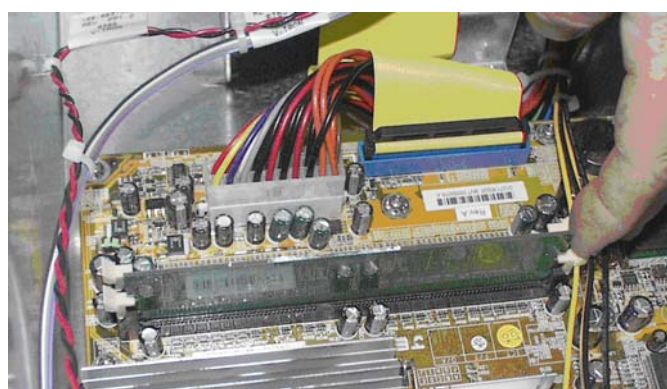
**Description**



## Remove Memory, RAM, 256 MB



Remove RAM by pushing out all four tabs to release RAM from formatter board.



## Install Memory, RAM, 256 MB

Place the memory into the socket, assuring alignment of the registration notch and lock it in place with the tab locks. The memory should be held in place by the tabs.



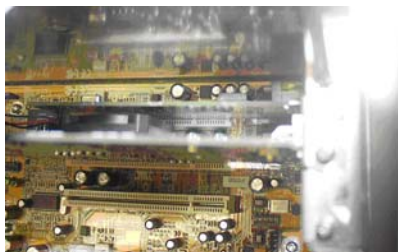
## Illustration

## Description

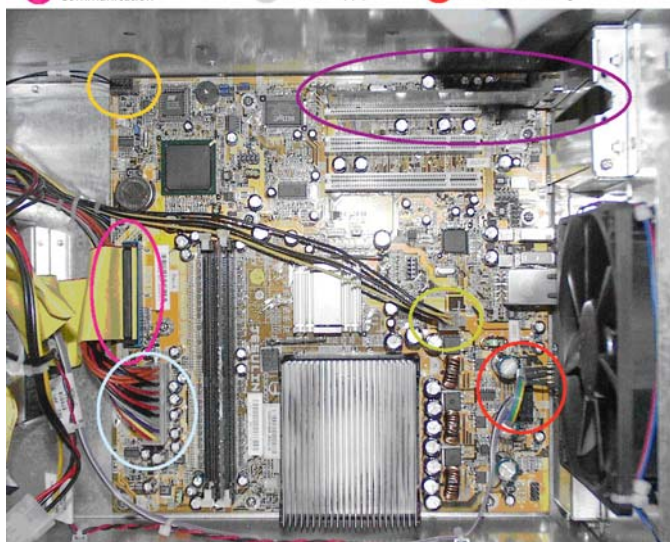


## Remove Formatter PCA

Remove Engine Board and Network Card.

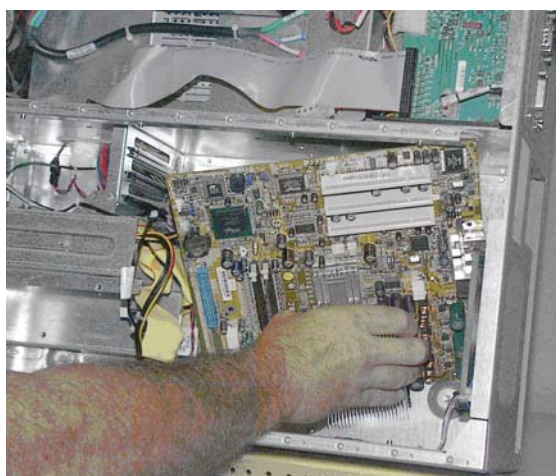


- Front Panel LED's
- Land Card
- Power for fans
- Communication
- Power Supply
- Interconnect Debug



Remove all cables attached to Main Board (Formatter).

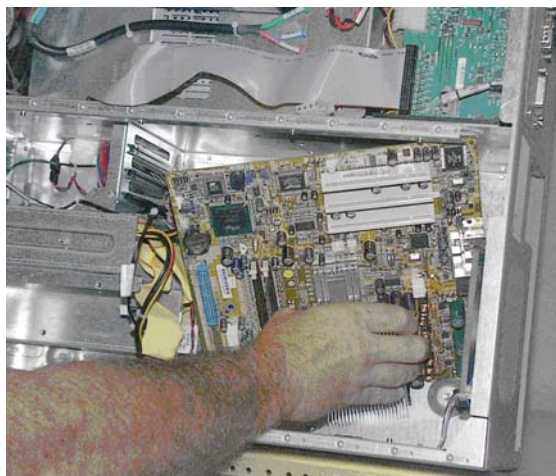
Remove all mounting screws and pull board upward. There are a total of nine screws.



Remove Formatter board from Controller.

**NOTE:** Be careful as you pull board, as you may have to angle it to get it out. The same goes as you put the board in.

## Illustration



## Description

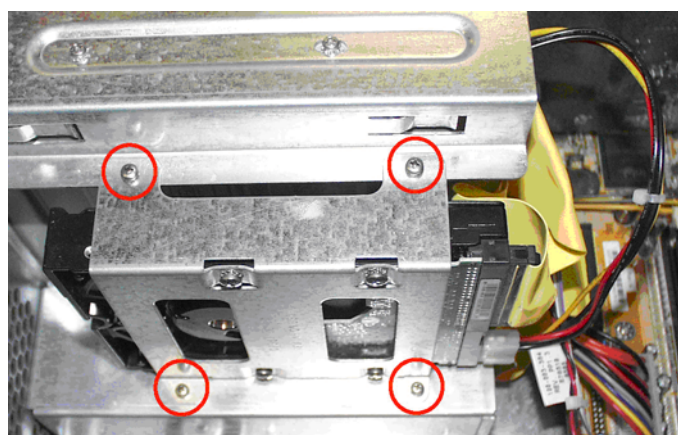
### Install Formatter PCA

Place the Formatter PCA over the mounting standoffs and fasten with the nine screws.

Connect all cables.

Reinstall microprocessor and the microprocessor fan.

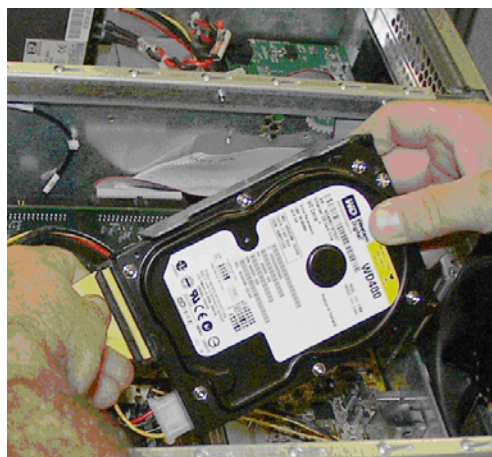
Install new cable ties to replace all cable ties cut.



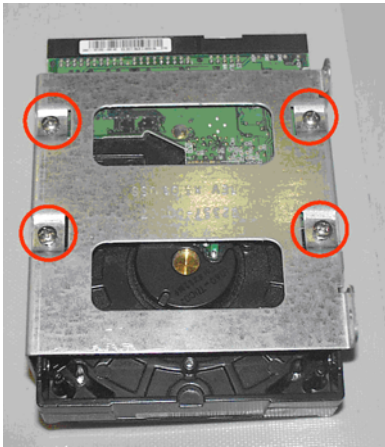
### Remove Hard Disk Drive

**NOTE:** Be careful as you pull board, as you may have to angle it to get it out. The same goes as you put the board in.

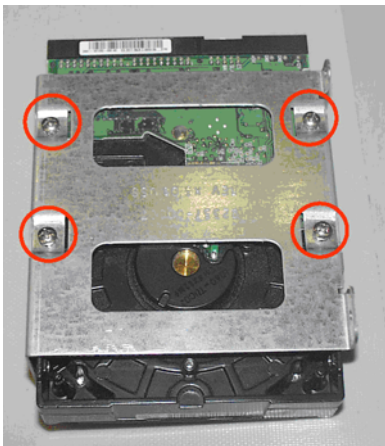
Remove the four screws from the bracket to release the hard drive from the Controller.



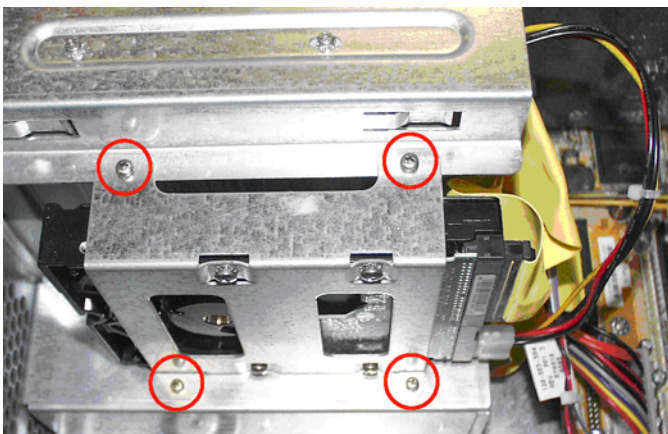
Remove the hard drive ribbon cable.

**Illustration****Description**

Remove hard drive from bracket by removing four screws.

**Install Hard Disk Drive**

Attach the new hard drive to its bracket.



Attach the hard drive, with its mounting bracket, onto its mounting position on the controller chassis

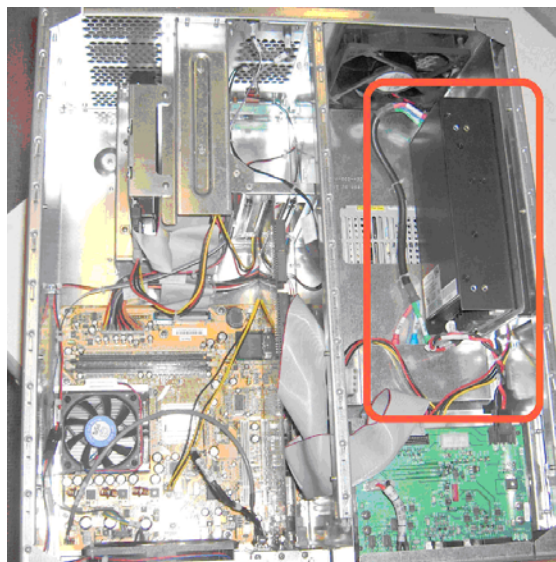
Connect the ribbon cable to the hard drive.



---

**Illustration**

**Description**



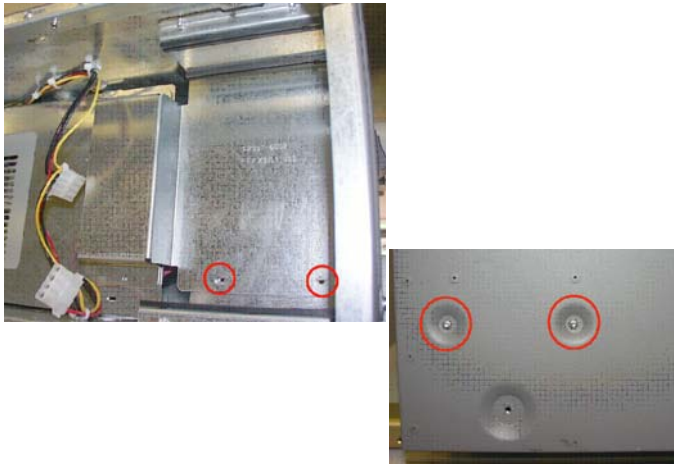
Remove Aux PSU AC - DC, 24V Power Supply



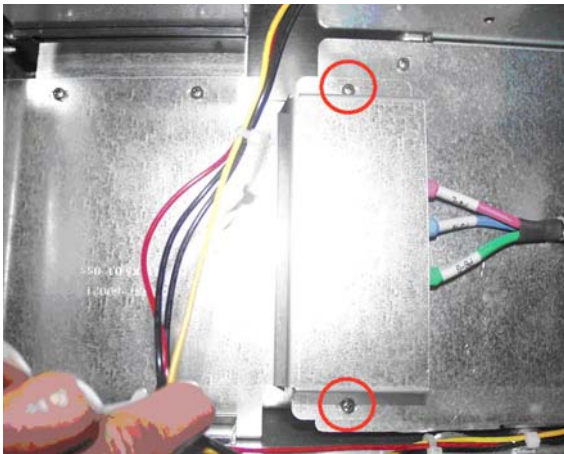
Remove cables from the Interconnect board.



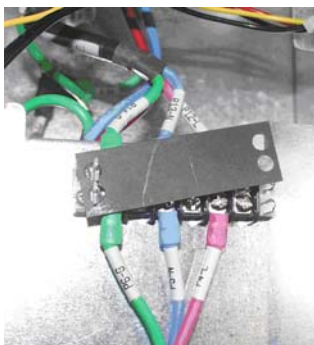
Remove two screws from the Interconnect board to pull the card out.

**Illustration****Description**

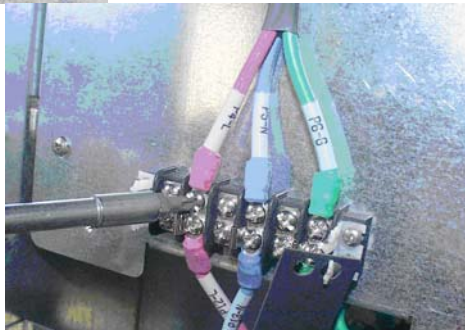
Remove metal cover by unscrewing a total of four screws.



Remove two more screws from cover to release it.



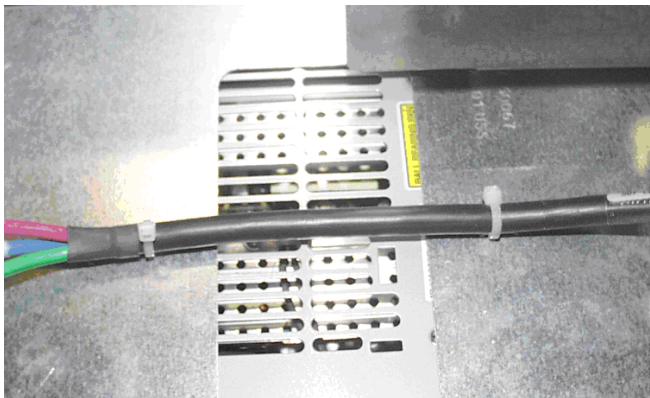
Remove black barrier strip cover to access screws.  
Unscrew the six cables.



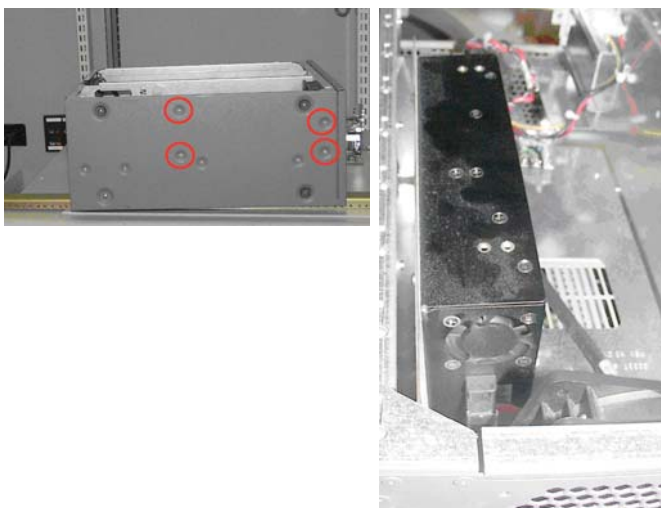
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**Illustration**

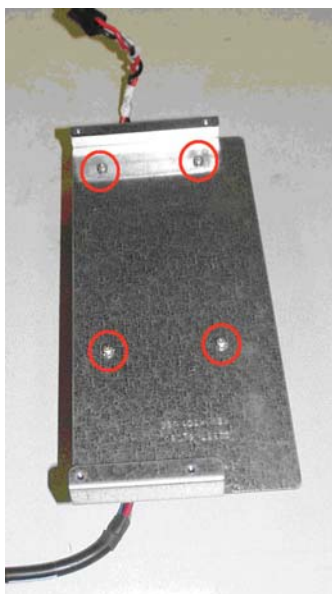
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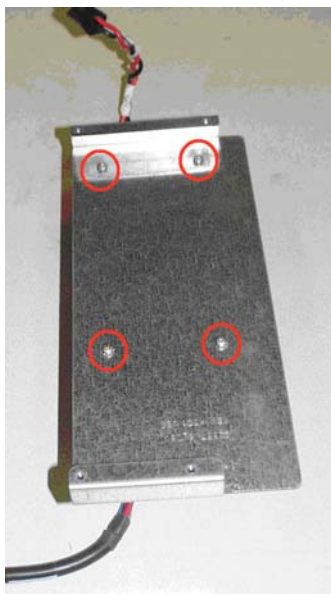
**Description**

Cut the cable ties to release power supply from the Controller.



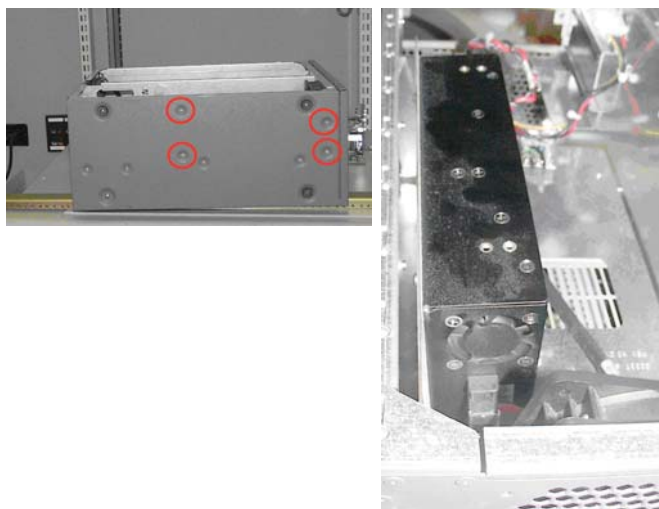
Remove four screws from the outside of the Controller to release the power supply from the unit.



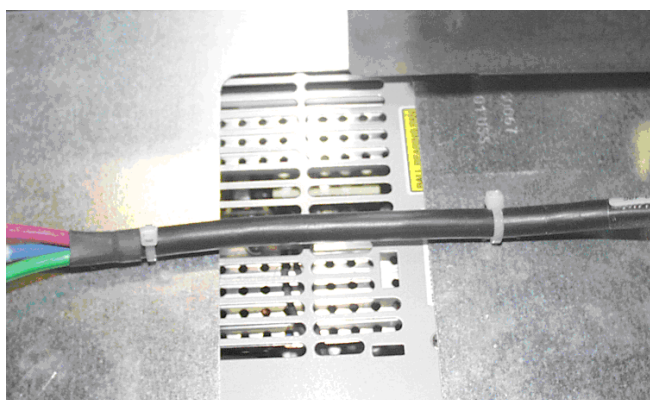
**Illustration****Description**

## Install Aux PSU AC - DC, 24V Power Supply

Install the four screws from the metal plate to attach the power supply.



Install four screws from the outside of the Controller to attach the power supply to the unit.

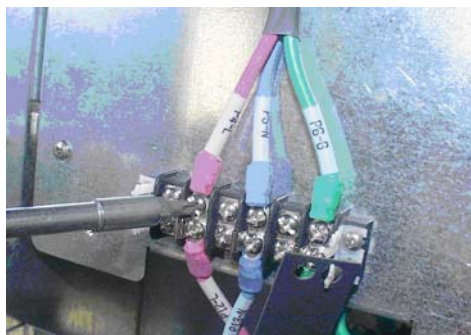


Replace all cut cable ties.



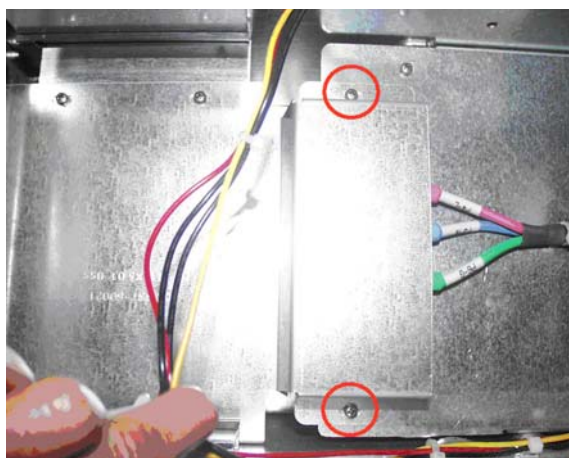
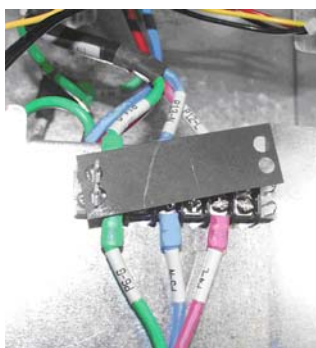
## Illustration

## Description

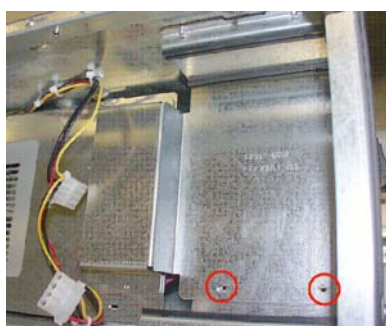


Attach all six cables to the barrier strip and follow the original color code. Assure that the same color cables are opposite each other on the barrier strip.

Attach the barrier strip cover.



Place the AC power cover into its position and fasten it to the plenum with two screws.



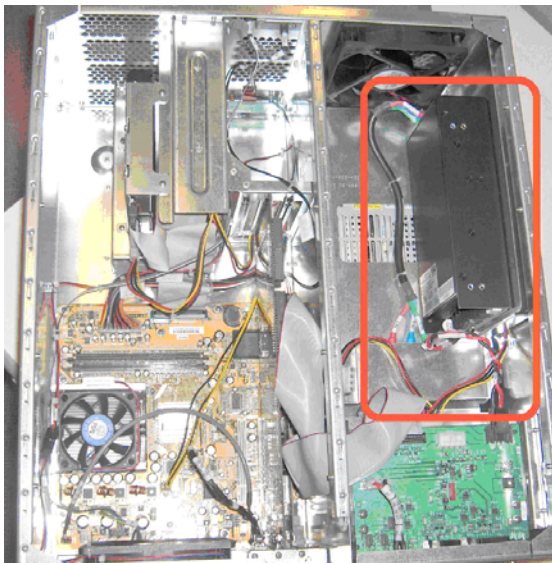
Continue to attach the AC power cover to the controller chassis, with two screws to the outside wall and two screws to the internal mounting positions.





**Illustration****Description**

Re-install the INTCA PCA and fasten with the two screws.



Verify all cable connections to the 24 V AUX supply.



Attach all cables to the INTCA PCA.

---

**Illustration**

---

**Description**

---

## Remove ATX Power Supply Unit

---

**NOTE:** There are two models of controllers. The difference in the ATX power supply is that the 7474A model has a barrier strip between the 24v power supply AC input and the main AC power. The 7473L has no barrier strip, and a long cable to the main AC input

---

**Before you begin:**

Remove the Aux PSU AC - DC, 24V power supply.

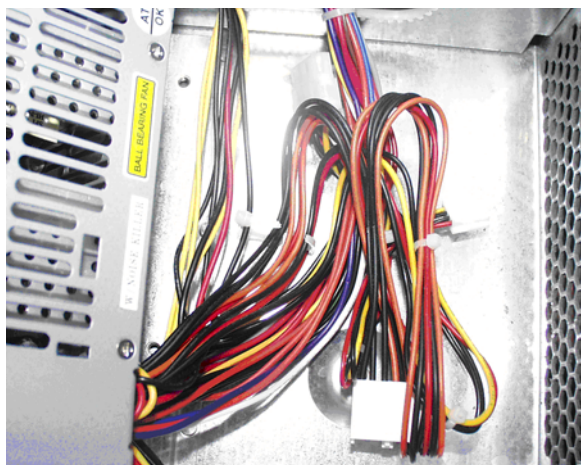
---



Looking down at the ATX power supply, remove the screws attaching the ATX to the chassis base.

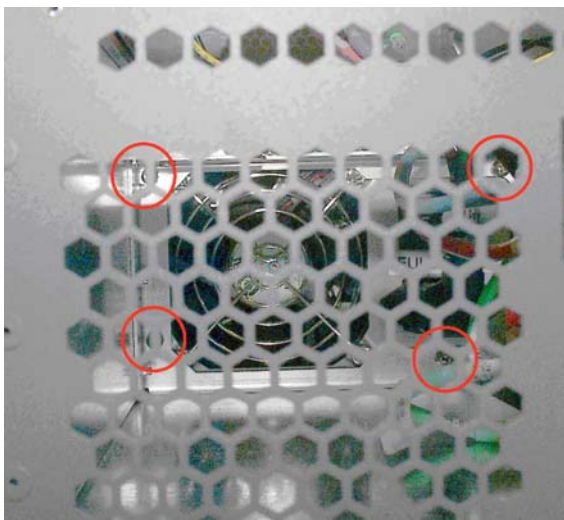
Remove two screws from the back of the power supply.

---



Cut the cable tie to remove power supply from the Controller. Cable connections on the digital side of the chassis must be undone. Route cables through the chassis partitioning wall to remove the power supply.

---

**Illustration****Description**

Remove four screws by either using an extension that fits through the panel holes, or a very small-handled Phillips screwdriver.



Unplug the power supply and remove it from the Controller.

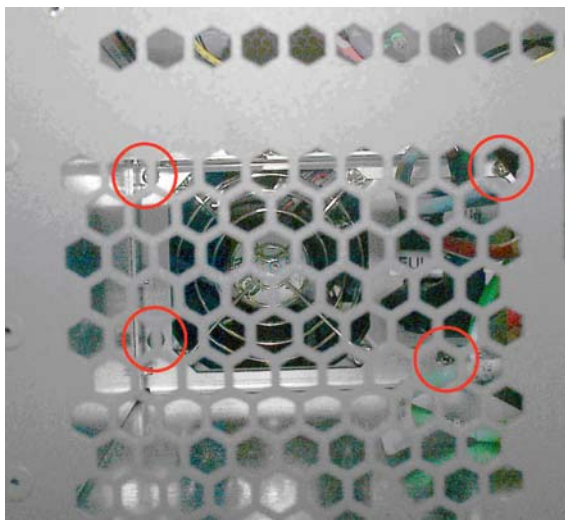


## Install ATX Power Supply Unit

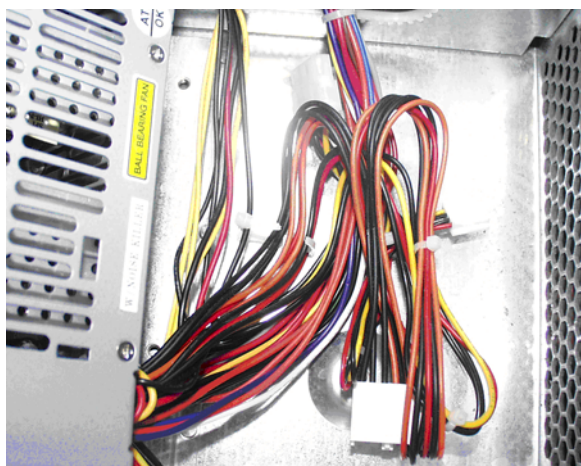
Place the new power supply onto its mount location and install the screws that attach the power supply to the chassis base.



---

**Illustration****Description**

Install four screws by either using an extension that fits through the panel holes, or a very small-handled Phillips screwdriver.

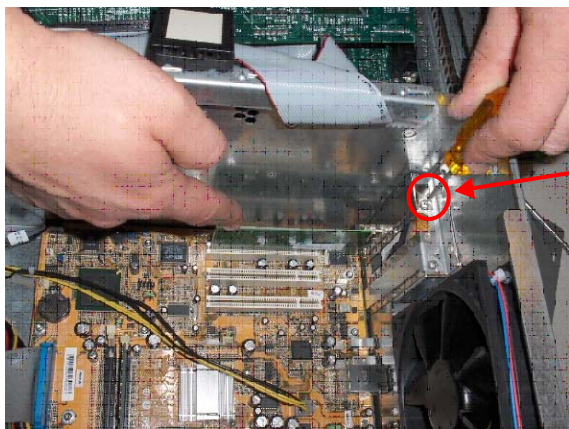


Route all power supply output cables through the opening in the chassis partitioning wall.



Connect the AC power to the ATX; assure that the power switch is in the ON position.

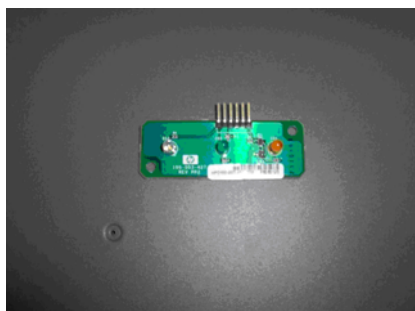
---

**Illustration****Description**

## Replace Network Card

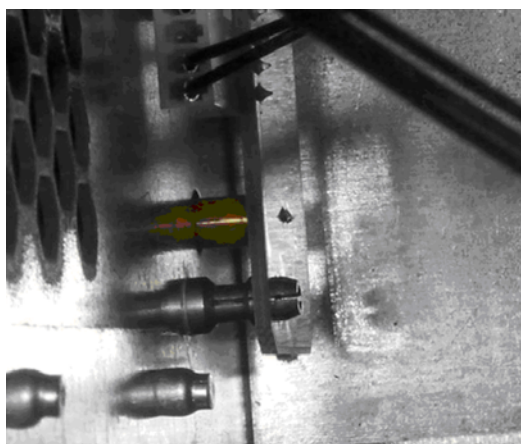
The network card is located near the rear fan.

Remove one screw and pull the network card from the formatter board.



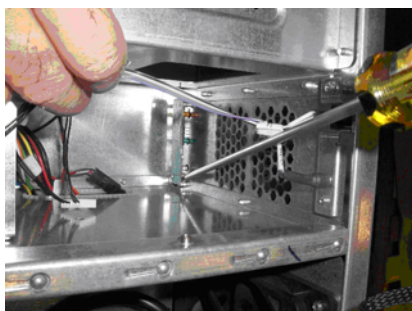
## Replace LEDs

The LEDs are located near the hard drive.



The LEDs pop out fairly easily with the use of a tool such as a screwdriver.

You can now install a new LED.



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# Appendix A: RoHS vs. Non-RoHS Part Numbers

In compliance with the Restrictions of Hazardous Substances ("RoHS" Directive), many of the HP mPrinter 4000 Fixed Imager part numbers are changing. Please check the table below to determine whether or not your part number is RoHS or Non-RoHS.

RoHS Part Number	Non-RoHS Part Number	Part Name	Model Number
Q2326L	Q2326A	HP Ink Delivery System (IDS)	SDSPS-0501-04
Q2337L	Q2337A	HP Imaging module	SDSPS-0501-03
Q7473L	Q7473A	HP Imager controller	SDSPS-0501-01
Q7474L	CB882L	External cable set	
Q2389L	Q2389A	HP Black 4240 pigment printhead	
Q2326-60011	Q2326-60011	HP Black 4240 printhead cleaner	
Q2390L	Q2390A	HP Black 4240 pigment 775 ml ink cartridge *	
C8863L	C8863A	Setup printhead	



**NOTE:** \* Check with account manager and application engineer for a current list of approved inks.

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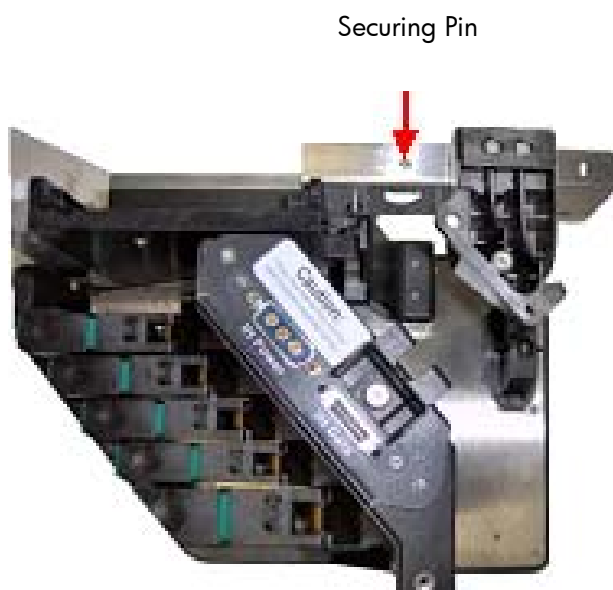
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## Appendix B: Transporting Components

Most Imager components may remain mounted on the imaging system for transport to a different job site or installation. However, the Imaging Module is sensitive to shock and must be properly packaged when moved farther than across a room.

### Move Across a Room



1. Raise the Imaging Head up to the transport position.



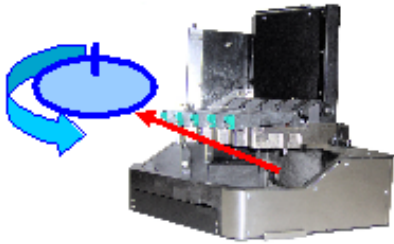
**NOTE:** The printheads are decapped and will become plugged if left decapped for any length of time.

2. Insert the securing pin.
3. Move the Imager.
4. Once in position, remove the securing pin, store it in the pin holder by the strain relief.
5. Lower the Imaging head to ensure that the printheads are recapped.



**CAUTION:** To move the Imaging Module ALWAYS move the Imaging Head into the transport position and secure it with the pin. This procedure must be followed whenever the Imaging Module is removed from the printing system support structure, including for cleaning or transport. Failure to secure it in the transport position can misalign the Imaging Head which will make it difficult to align the printing system.

## Move to New Installation



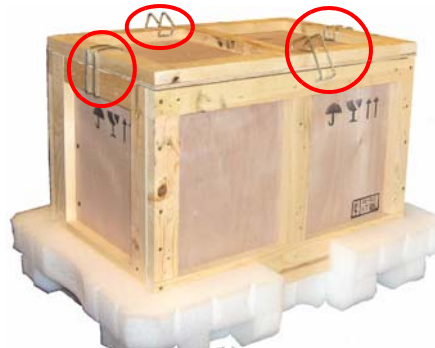
3



6



7

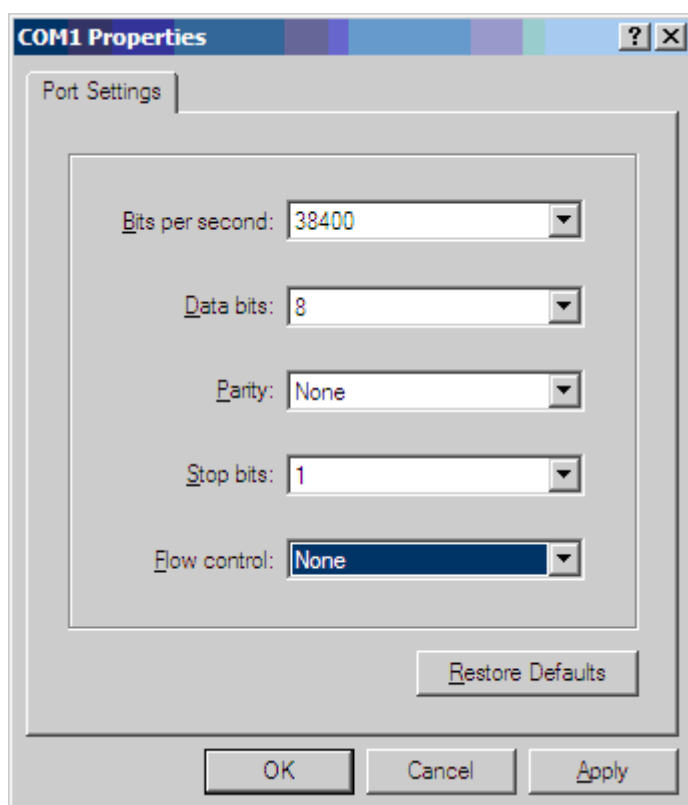


9

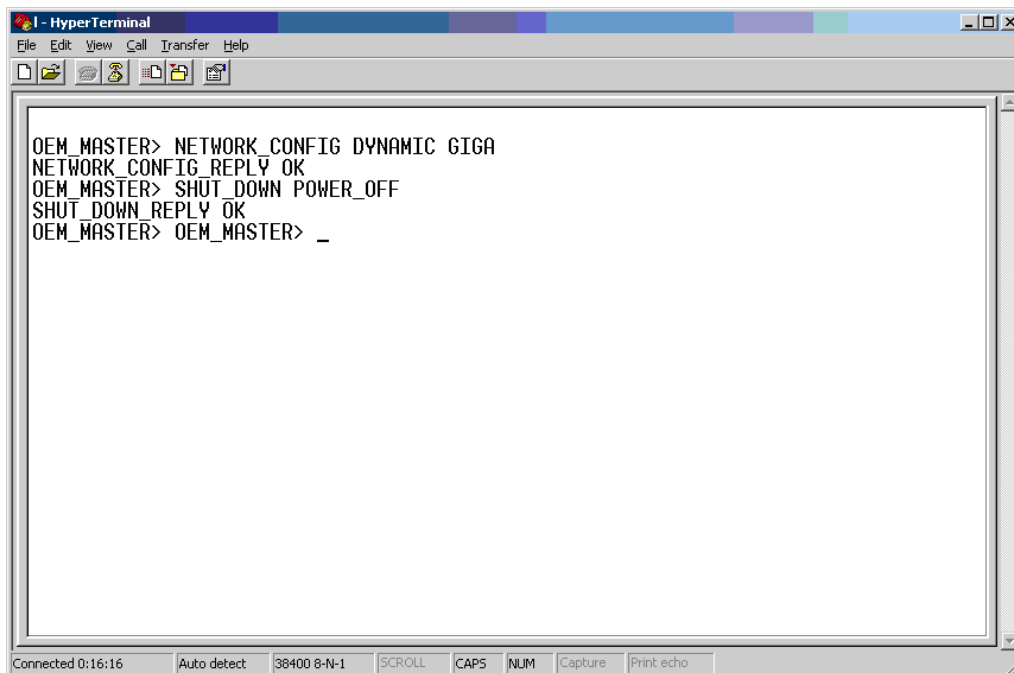
1. Raise the Imaging Head up to the transport position.
2. Reach under the Imaging Head, locate the elevator nut.
3. Turn the elevator nut to the right as far as it will go.
4. Insert the securing pin.
5. Remove the imaging Head from the mounting bridge.
6. Attach the Imaging Module to the support board in the Imaging Module crate.
7. Slide the Imaging Module and support board into the crate.
8. Secure the support board and strain relief to the crate.
9. Close the crate, secure the lid with the clips. The Imaging Module is ready for transport.

# Appendix C: Changing an IP Address

1. Connect a serial 'null modem' cable to the imager's RS-232 communication port and to a PC's RS-232 port.
2. Boot the Imager, then start the HyperTerminal program from the windows.
3. Change the settings to match those in the figure below:



4. When connected hit **Enter**; the prompt should appear on the window. If OEM\_MASTER> does not appear onscreen, then some of the parameters are wrong. Close the window and try to connect again.
5. Type in NETWORK\_CONFIG STATIC GIGA ###.###.###.###(IP Address)  
###.###.###.###(Subnet Mask) ##.##.##.## (Gateway), then hit **Enter**.  
For Example: NETWORK\_STATIC GIGA 192.168.1.5 255.255.255.0 0.0.0.0  
You should receive this message as a response: NETWORK\_CONFIG\_REPLY OK
6. Type in SHUT\_DOWN REBOOT, then press **Enter**.



7. Now you should be able to connect through crossover cable using the IP address of the EE box.

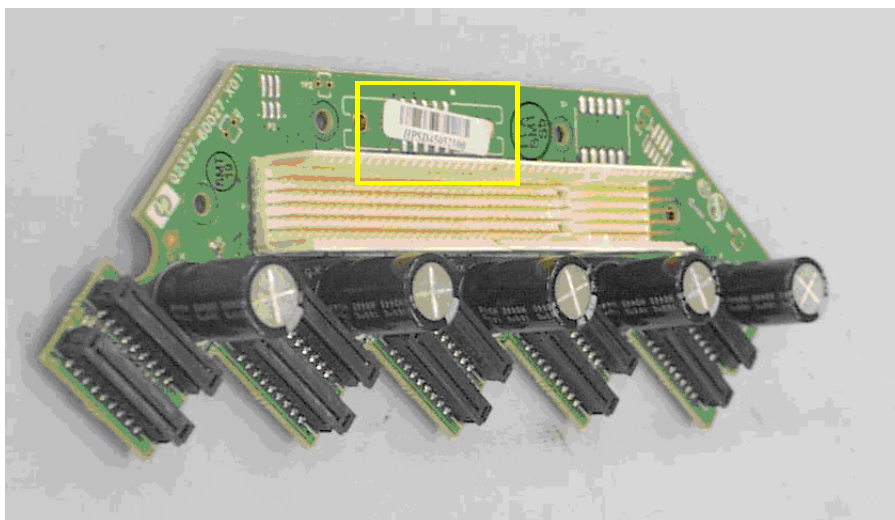
## Appendix D: Part / Serial Number Locations in Replacement Parts



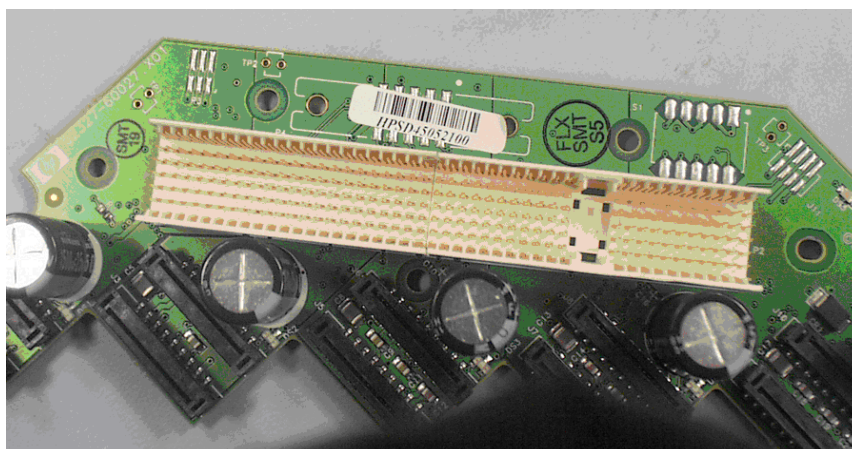
**NOTE:** The replacement part number is **not** the same as the part number found on the item. The replacement part number must be used when recording items in the Incident Report.

### Part / Serial Numbers

#### Backplane PCA

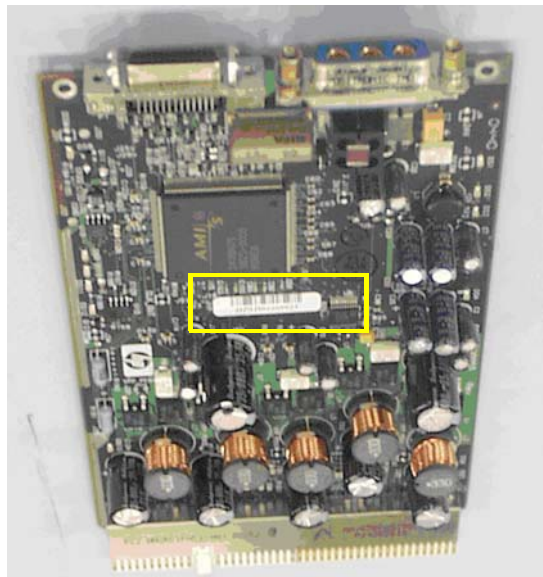


#### Serial Number for Backplane PCA



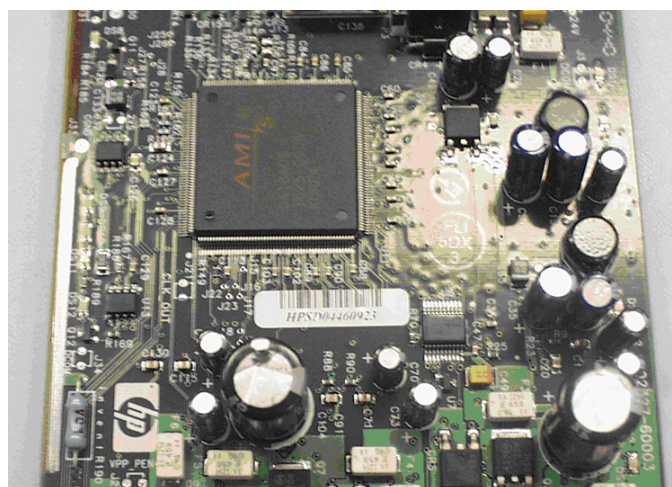
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## Carriage PCA



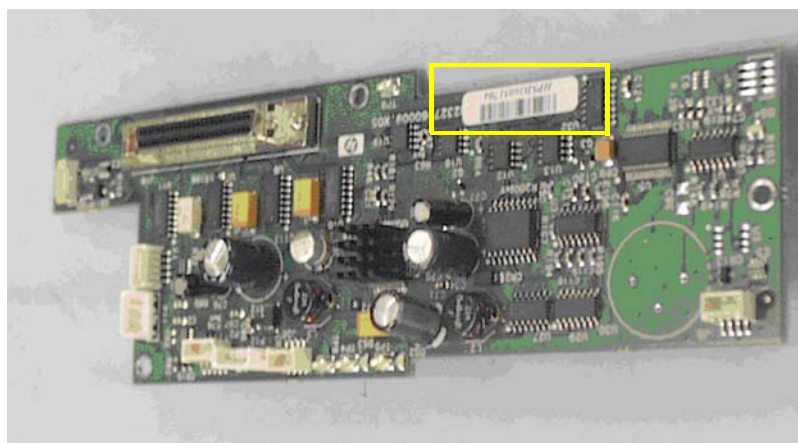
---

## Carriage PCA Serial Number



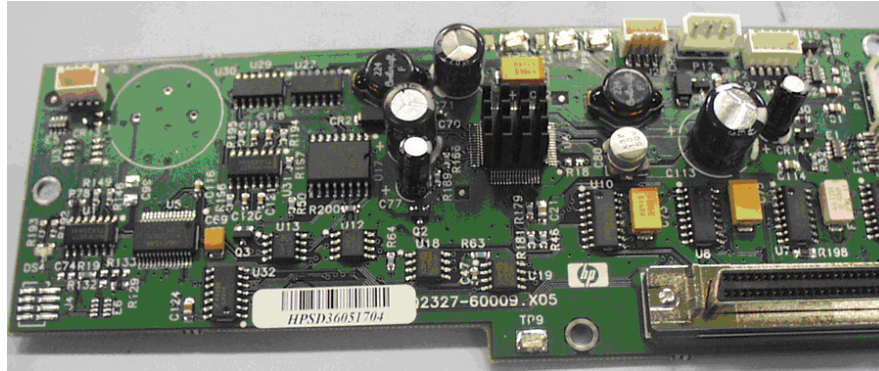
---

## Servo PCA

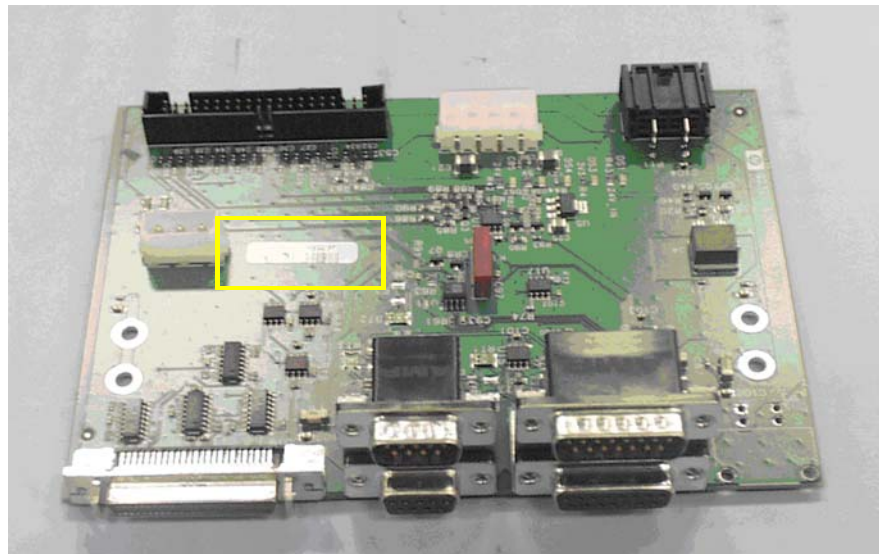




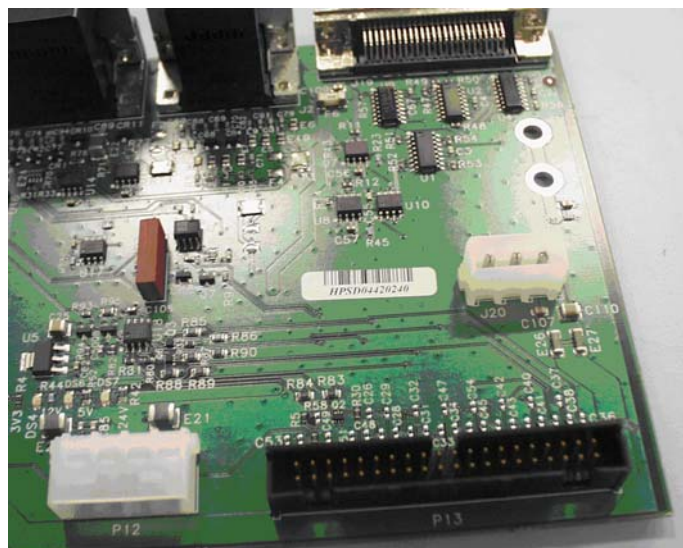
## Servo PCA Serial Number



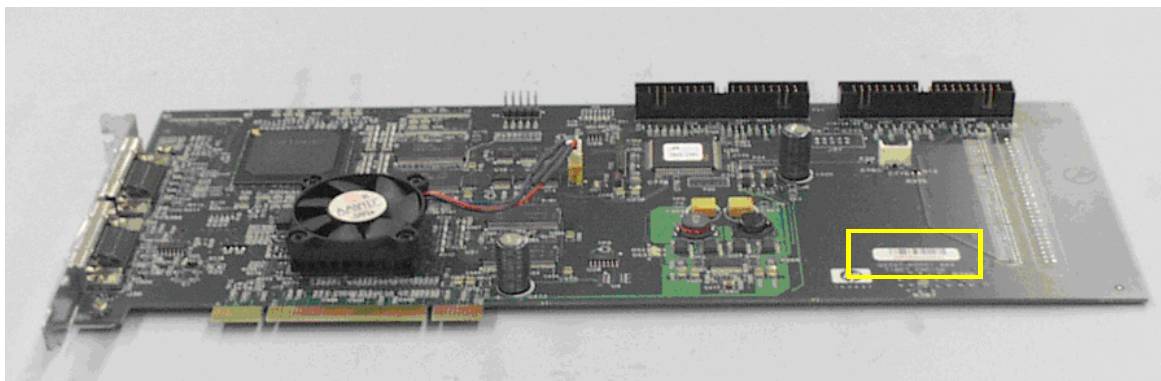
## Interconnect PCA



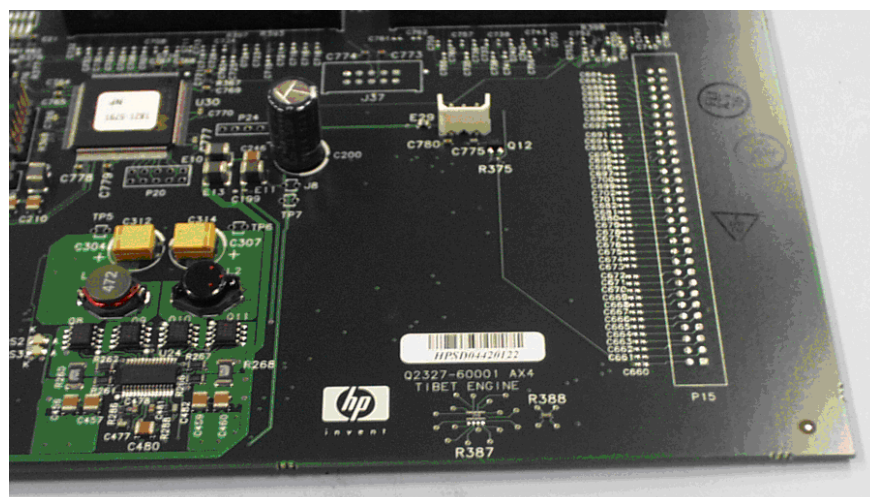
## Interconnect PCA Serial Number



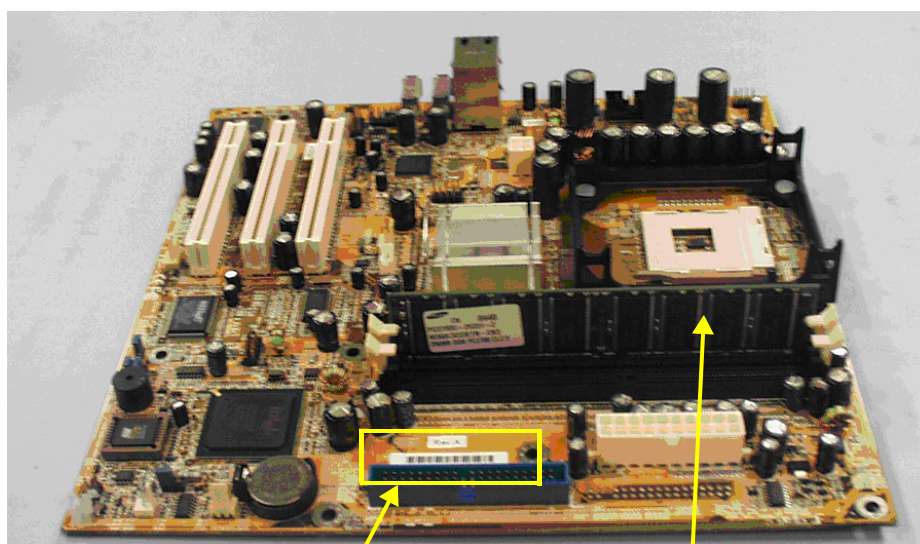
## Engine PCA



## Engine PCA Serial Number



## Motherboard



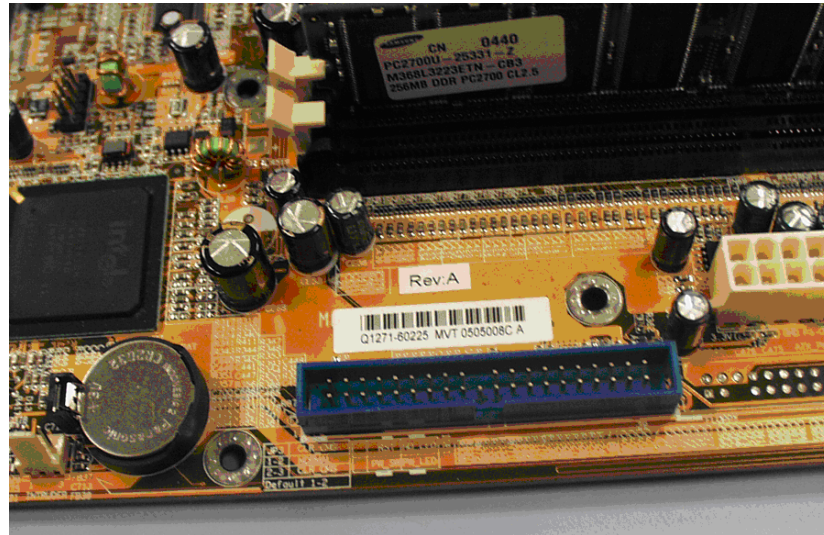
Part Number

Serial Number (hidden  
from this angle)



---

## Motherboard Part Number



---

## Motherboard Serial Number



---

## Hard Drive



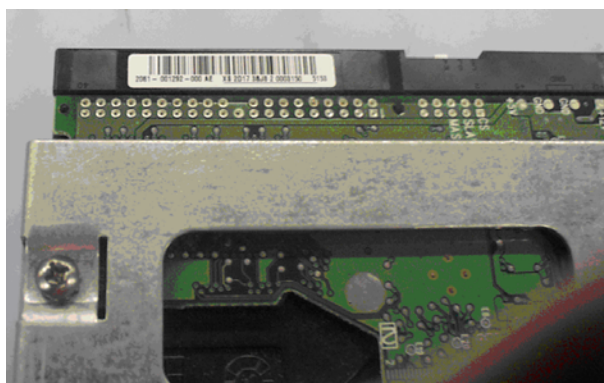
---

## Hard Drive Serial Number



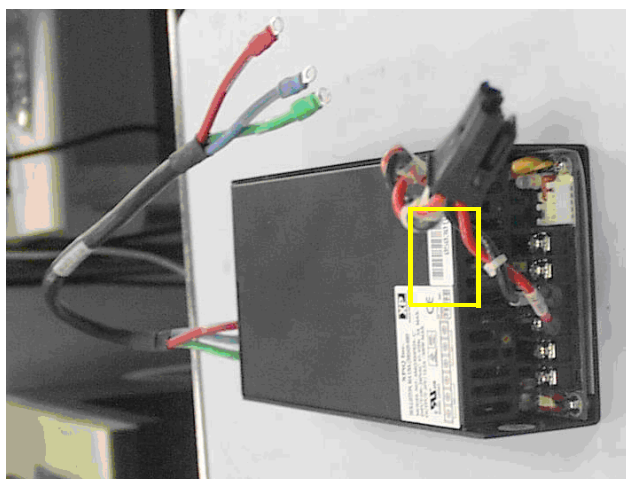
---

## Hard Drive Serial Number



---

## 24 V Power Supply



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## 24 V Power Supply Serial Number



---

## ATX Power Supply



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## ATX Power Supply Serial Number



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# Appendix E: Service and Repair Tools

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## Imager Tools

½" wrench (packaging)

Screwdriver, slotted, regular style (blade length 8", 203 mm Screwdriver length: 12 ½", 317 mm) (packaging)

Beau - Tech SH - 20B Solder Aid 8" length angled reamer & fork *or*

Slotted screwdriver 3/32" x 2"

Phillips screwdriver

Multi-bit screwdriver

Bit holder extension

T8 2 mm Torx bit

Slotted screwdriver

Hex 5 mm bit

Hex 4 mm bit

Hex 3 mm bit

Hex 2 mm bit

Hex 2.5 mm bit

3/16 Hex driver

0.05" Allen driver

---

## EE Box Tools

64-171 - 1-point 100 PLUS® Phillips® Tip Screwdriver (overall length 343 mm, 13 ½")

Cutters

4" cable ties

Push mount cable ties

T8 2 mm Torx bit

Regular Phillips screwdriver with blade diameter of 3/16" and a blade length of 6"

8 mm hex driver

---

## IDS Tools

Push mount cable ties

Regular Phillips screwdriver with blade diameter of 3/16" and a blade length of 6"

3/16 hex driver

9/32" nut driver

# Appendix F: Fastener Seating Torque

The process following refers to values in [Table F-1](#), at the end of this appendix.

## Fastener Driver Calibration

### Purpose

To ensure uniform fastener seating in the various TIJ 3.X assemblies.



**NOTE:** The frequency of verification and calibration is usually dependent upon tool quality, number of fasteners driven, wear of the clutch, and driver mechanical components. The actual verification and calibration frequency will be determined over time, based on tool usage. However, it is recommended that the drivers be calibrated at least once per week.

### Equipment

Mountz model EZ TORQ 1001 Torque Analyzer.

### Power Drivers Procedure

Frequency: TBD (Minimum of once per week)

1. Verify recommended torque setting for the particular fastener.
2. Refer to [Table F-1](#) for fastener torque values.
3. Torque Analyzer settings:  
Use: **LBF.IN, PEAK, FILTER 1500 HZ SETTING** for the Torque Analyzer.
4. Partially thread, 3-4 threads, an M3 TorX recess machine screw fastener at least 10 mm long in the threaded adaptor.
5. Insert a suitable TorX bit into the tool to match the screw recess.
6. Run the fastener to the point where it seats and the driver clutch disengages.
7. Read results on Analyzer LCD readout.  
Spec: +/- 5% fastener recommended torque. Refer to [Table F-1](#) for specification.
8. Record value on spreadsheet (will be entered into manufacturing database).
  - Adjust if necessary.
9. Record new torque value if an adjustment to the torque setting is made.

If the tool varies more than 10% between calibrations, it may need maintenance, and/or repair.



## Mechanical torque screwdrivers or torque watches

Frequency: TBD (Minimum of once per week)

1. Verify recommended torque setting for the particular fastener.
  2. Refer to [Table F-1](#) for fastener torque values.
  3. Torque Analyzer settings:  
Use: **LBF.IN, PEAK, FILTER 1500 HZ SETTING** for the Torque Analyzer.
  4. Partially thread, 3-4 threads, an M3 TorX recess machine screw fastener at least 10 mm long in the threaded adaptor.
  5. Insert a suitable TorX bit into the tool to match the screw recess.
  6. Run the fastener to the point where it seats and the driver clutch disengages.
  7. Read results on Analyzer LCD readout.  
Spec: +/- 5% fastener recommended torque. Refer to [Table F-1](#) for specification.
  8. Record value on spreadsheet (will be entered into manufacturing database).
    - Adjust if necessary.
  9. Record new torque value if an adjustment is made to the torque setting.
- If the tool varies more than 10% between calibrations, it may need maintenance, and/or repair.

## Torque Analyzer Calibration

Frequency: Annual

Traceability: Required



**NOTE:** In the table below, lb/in = Pounds / Inch; N\*m = Newton meter

# Fastener Nominal Torque Table

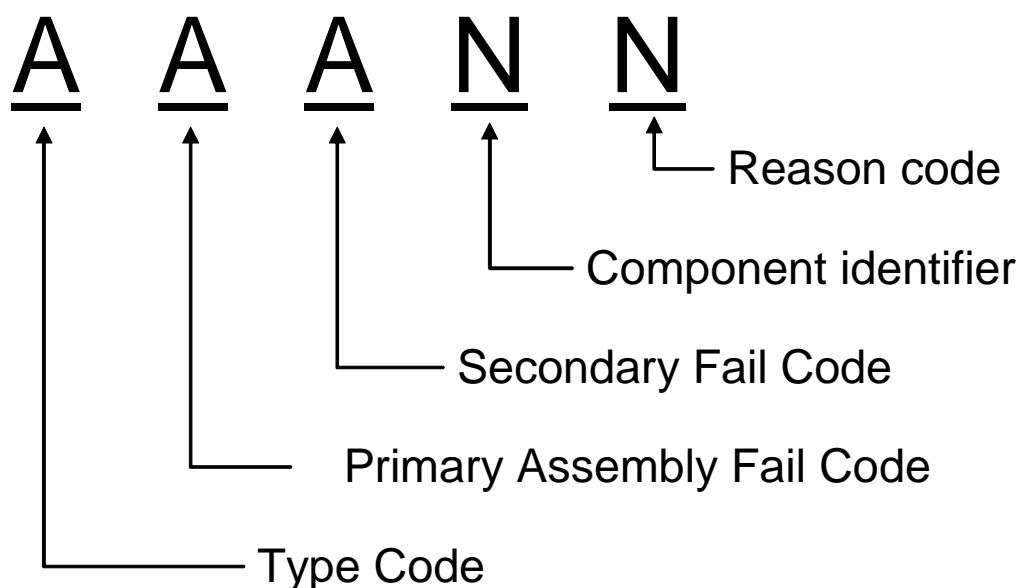
**Table F-1** Fastener Seating Torque Values

Fastener size	Thread Type	Style	Recommended Torque value (Steel)		Recommended Torque value (Aluminum)		Recommended Torque value (Plastic)		Units: Dependent on parent material resin and hole diameter							
			Torque	Units	Torque	Units	Torque	Units	Torque	Units	Type	Style	Torque	Units	Torque	Units
M1.6	Machine	Socket Head, Cap	1.0	lb/inch	0.12	N*m	0.5	lb/inch	0.056	N*m						
		Button Head	1.0	lb/inch	0.12	N*m	0.5	lb/inch	0.056	N*m						
											Plastite	Pan Head	NA	lb/inch	NA	N*m
M2.5	Machine	Socket Head, Cap	4.0	lb/inch	0.45	N*m	1.9	lb/inch	0.21	N*m						
		Button Head	4.0	lb/inch	0.45	N*m	1.9	lb/inch	0.21	N*m						
											NA					
M3	Machine	Socket Head, Cap	7.6	lb/inch	0.86	N*m	3.6	lb/inch	0.41	N*m						
		Pan Head	7.6	lb/inch	0.86	N*m	3.6	lb/inch	0.41	N*m						
											Plastite	Pan Head	3.5 - 4.0	lb/inch		N*m
												Button Head	3.5 - 4.0	lb/inch		N*m
M4	Machine	Socket Head, Cap	17.7	lb/inch	2.00	N*m	8.4	lb/inch	0.94	N*m						
		Pan Head	17.7	lb/inch	2.00	N*m	8.4	lb/inch	0.94	Nm						

**Table F-1** Fastener Seating Torque Values

Fastener size	Thread Type	Style	Recommended Torque value (Steel)				Recommended Torque value (Aluminum)				Recommended Torque value (Plastic)		Units: Dependent on parent material resin and hole diameter			
			Torque	Units	Torque	Units	Torque	Units	Torque	Units	Type	Style	Torque	Units	Torque	Units
							NA	lb/inch		Nm	Plastite	Pan Head	5.5 - 7.5	lb / inch		N*m
<b>M5</b>	Machine	Socket Head, Cap	59.0	lb/inch	4.00	N*m	16.9	lb/inch	1.9	N*m						
		Pan Head	59.0	lb/inch	4.00	N*m	16.9	lb/inch	1.9	N*m						
<b>M6</b>	Machine	Socket Head, Cap	60.0	lb/inch	11.50	N*m	28.7	lb/inch	3.2	N*m						
		Pan Head	60.0	lb/inch	11.50	N*m	28.7	lb/inch	3.2	N*m						
											Plastite	Pan Head	NA	lb/inch		N*m
<b>M8</b>	Machine	Socket Head, Cap	147.0	lb/inch	16.70	N*m	70.0	lb/inch	7.9	N*m						
		Pan Head	147.0	lb/inch	16.70	N*m	70.0	lb/inch	7.9	N*m						
				lb/inch			NA	lb/inch		N*m	Plastite		NA	lb/inch		N*m
<b>M10</b>	Machine	Socket Head, Cap	292.0	lb/inch	33.0	N*m	138.0	lb/inch	15.6	N*m						
		Pan Head	292.0	lb/inch	33.0	N*m	138.0	lb/inch	15.6	N*m						

# Appendix G: Repair and Fail Codes



## Type Code

- R = Repair
- C = Customer

Type Code allows classification of customer complaints so they can be recorded and tracked while using the same coding scheme. When using the code scheme to classify a complaint the last 2 digits are not included, which is recorded in the Incident Report next to the customer name.

## Primary and Secondary Codes

Primary Fail Code (Failed Module)		Secondary Fail Code (Failure Type)	
C	Controller	E	Electrical
H	Head, Image	M	Mechanical
I	IDS	S	Supply
P	Printhead	Z	Software
Q	Ink Cartridge		
S	Service Station		

<b>Primary Fail Code (Failed Module)</b>	<b>Secondary Fail Code (Failure Type)</b>
X	External cables

Primary Codes identify the module or supply

Secondary Code identifies the class: supply, software, mechanical or electrical.

## Last Two Digits

This code is made up of the number that identifies the component that was repaired, and the reason code why it was removed/replaced.

## Component Identifier for the Primary/Secondary Codes

	<b>Component ID</b>
<b>CE</b>	<b>Controller Electrical</b>
1	Engine PCA
2	Motherboard
3	INTC PCA
4	Interface PCA
5	Internal Cable
6	Hard Drive
7	ATX
8	24V PS
9	Fan /Processor
A	Fan, Cooling
B	Filter
C	uP/Fan
<b>CM</b>	<b>Controller Mechanical</b>
1	Door
2	Case
3	Paint
4	Nomenclature
5	Packaging

	<b>Component ID</b>
<b>IE</b>	<b>IDS Electrical</b>
1	PCA
2	Pump/Valve
3	Cable
<b>IM</b>	<b>IDS Mechanical</b>
1	Case
2	Tube/Check Valves
3	Valve/Pump
<b>PE</b>	<b>Pen Electrical</b>
1	Acumen
2	Communication
<b>PM</b>	<b>Pen Mechanical</b>
1	Leaks
2	Clogged Nozzle
3	Body
<b>SE</b>	<b>SVS Electrical</b>
1	PCA
2	Motor
3	Sensor

	Component ID
<b>HE</b>	<b>Head Electrical</b>
1	Carriage PCA
2	Backplane PCA
3	Flex circuit
4	Connectors, Cables
5	ZIF connector
6	Sensor
7	Calibration
<b>HM</b>	<b>Head Mechanical</b>
1	Slide
2	Case
3	Plastic
4	Retention Bracket
5	Lock
6	Pen Array
7	PQ

	Component ID
<b>SM</b>	<b>SVS Mechanical</b>
1	Carriage
2	Sensor
3	Door Sensor
4	Motor
5	Nut
6	Cables
7	Case
<b>QE</b>	<b>Cartridge Electrical</b>
1	Acumen
2	Communication
<b>QM</b>	<b>Cartridge Mechanical</b>
1	Leaked
2	Damaged
<b>XE</b>	<b>External Cables Electrical</b>
1	Electrical
<b>XM</b>	<b>External Cables Mechanical</b>
1	Damaged

## Reason Codes

- 1 = Root Cause part. Replacing the part corrects the problem.
- 2 = Replaced due to victim of problem, was damaged or suspected of damage from original problem.
- 3 = Replaced to avoid future warranty failure.
- 4 = NTF, no trouble found.
- 5 = Other.
- 6 = Defective from Stock.
- 7 = Service Note requirement.

### **Example:**

The technician finds a controller engine PCA that has to be changed due to a service note:

The Code is RCE17

Type	R = Repair
Primary	C = Controller
Secondary	E = Electrical
Component ID	1 = Engine PCA
Reason code	7 = Service Note

This code would be recorded by the technician in the Repair Code box of the [Warranty Incident Report](#).



# Appendix H: RS-232 Port and OEM Troubleshooting and Maintenance

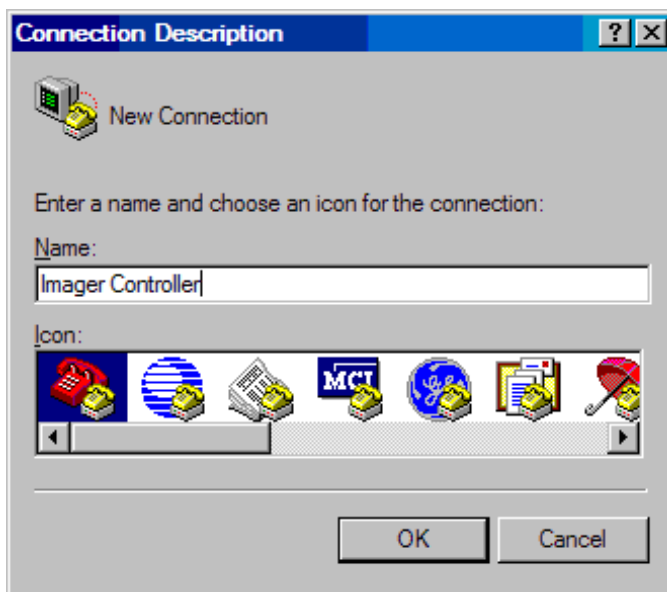
## About the RS-232 Serial Interface

The parameters for the serial connection are (BPS = 38400, Data bits = 8, Parity = None, Stop bits = 1, Flow control = None). The interface has been tested with HyperTerminal software. Once the serial connection is made, send a line feed to obtain the "OEM\_MASTER>" prompt. At this point, any OEM command can be sent, and a response will be received in the same fashion as over the socket port (but the prompt will be appended). There is no method to send data, or update the software, over the serial interface.

## Troubleshooting

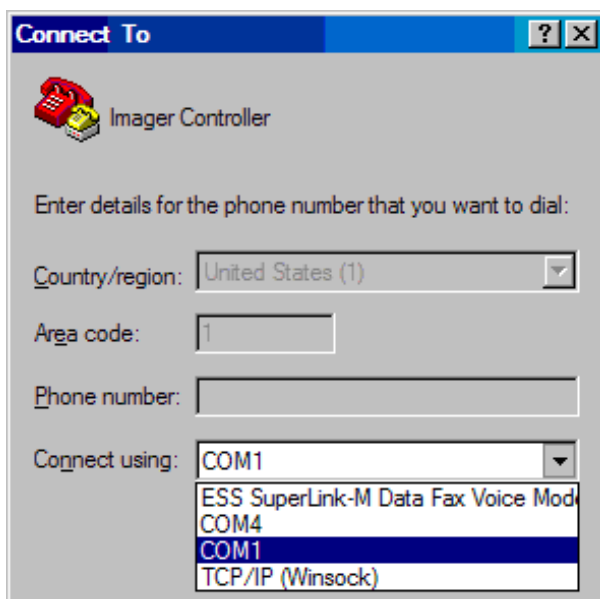
Start the HyperTerminal application in Windows XP by clicking on Start > All Programs > Accessories > Communications > HyperTerminal. When asked if you want to make HyperTerminal your default Telnet program, click on **No**.

1. Insert "Imager Controller" into the Name box and click on **OK**.



**Figure H-1** Showing Connection Description dialogue box

2. In the pull-down menu that says "Connect using", select "COM1" and click **OK**.

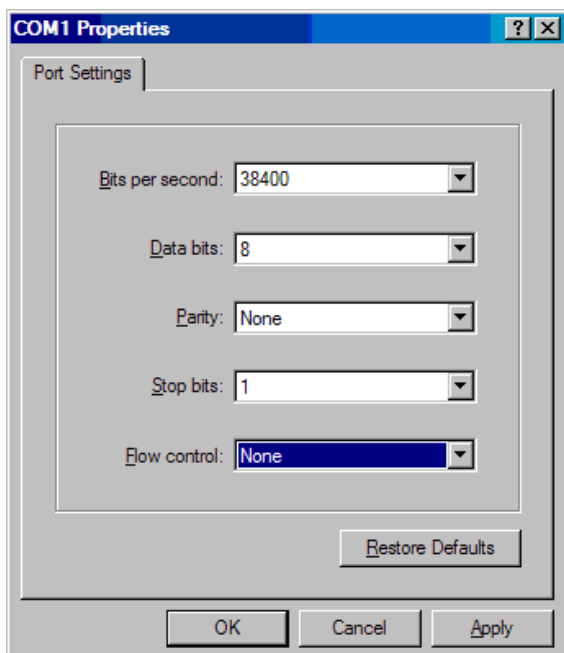


**Figure H-2** Showing the selection of COM1 in the “Connect to” dialogue box

3. In the COM1 Properties dialogue box, make the following selections:

Bits per second	38400
Data bits	8
Parity	None
Stop bits	1
Flow control	None

And then click **OK**.



**Figure H-3** Showing COM1 Properties dialogue box with proper selections

4. Press the **Enter** key. The system should respond "OEM\_MASTER>"
5. Example: Type `GET_SYSTEM_STATUS` (this must be in CAPITALS) and press **Enter**. The system should respond with `GET_SYSTEM_STATUS_REPLY OK ERROR 0` followed by two hexadecimal codes.
6. Closing the HyperTerminal: Click the "X" in the upper right-hand corner of the HyperTerminal window to close the HyperTerminal application.

## OEM Commands Typically Used in Troubleshooting

The following tables include information excerpted from the *HP mPrinter 4000 Firmware / Software Integration Guide (80074a73)*. See that document for further information, if required.

### Control Interface

Command Name	Command Description	No. of Parameters	Parameters	Returned Values & Number of Values
GET_SW_VERSION	GetSoftware Version	0	N/A	<Command Validation> SW_VERSION_X_X
UPDATE_SOFTWARE	UpdateSoftware	1	<Install Options> [INSTALL, FORCE]	<Command Validation>
MAINTENANCE	Imager Maintenance	1-3	<Instruction> <Imaging Module ID> <Element Index> <Servicing Level> (if applicable)	<Command Validation>
DIAGNOSTICS	Diagnostics	4	<Imaging Module ID> <Component Name> <Element Index> <Diagnostics Level>	<Command Validation>

## Status Interface

Command Name	Command Description	No. of Parameters	Parameters	Returned Values & Number of Values
GET_SYSTEM_STATUS	GetSystemStatus	0	N/A	<Command Validation> <Imager State> <RESERVED> [0] <Error Code List>
DIAGNOSTICS_RESULTS	DiagnosticsResults	4	<Imaging Module ID> <Component Name> <Element Index> <Diagnostics Level> (Integer)	<Command Validation> <Imaging Module ID> <Component Name> <Element Index> <Time> <Error Code List>
GET_LOG_FILE	GetLogFile	1	<Log File Type> [DIAGNOSTICS, ERROR_HISTORY, SYSTEM_HISTORY, EVENT_HISTORY, CRITICAL_PARAMETERS]	<Command Validation> <Log File Size (in bytes)> <Log File Content>

## Maintenance Instructions

These instructions are used in the MAINTENANCE command, to specify the desired operation:

Instruction Name	Parameters	Description
GET_STATUS	N/A	Gets the Maintenance state (Ex. IDLE, ACCESS, BUSY, ACCESS_FIX_ERROR)
PRINthead_REPLACE_START	<Imaging module ID> <Element index>	Prepare Imager for replacing printhead(s) Imaging Module ID
PRINthead_REPLACE_DONE	<Imaging module ID> <Element index>	Inform Imager that change is done Imaging Module ID
MANUAL_PRINthead_SERVICE_START	<Imaging module ID> <Element index>	Initiate printhead Manual Service
MANUAL_PRINthead_SERVICE_DONE	<Imaging module ID> <Element index>	Complete printhead Manual Service
MIDJOB_SERVICE ACCEPTED	<Imaging module ID> <Element index>	Perform the mid-job service now
RECOVER_PRINthead	<Imaging module ID> <Element index> <Servicing level>	Initiates the printhead recovery service

Instruction Name	Parameters	Description
CALIBRATE_IM_START	<Imaging module ID> <Element index>	Prepare for calibration of the imaging module with respect to the media path
CALIBRATE_IM_DONE	<Imaging module ID> <Element index>	Inform the Imager that the user is done with the calibration
PRIME_START	<Imaging module ID> <Element index>	Prime start
PRIME_CONTINUE	<Imaging module ID> <Element index>	Prime continue
PRIME_DONE	<Imaging module ID> <Element index>	Prime done
SWITCH_INK_SUPPLY	<Imaging module ID> <Element index>	Switch ink supply

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# Appendix I: Firmware Update Procedure

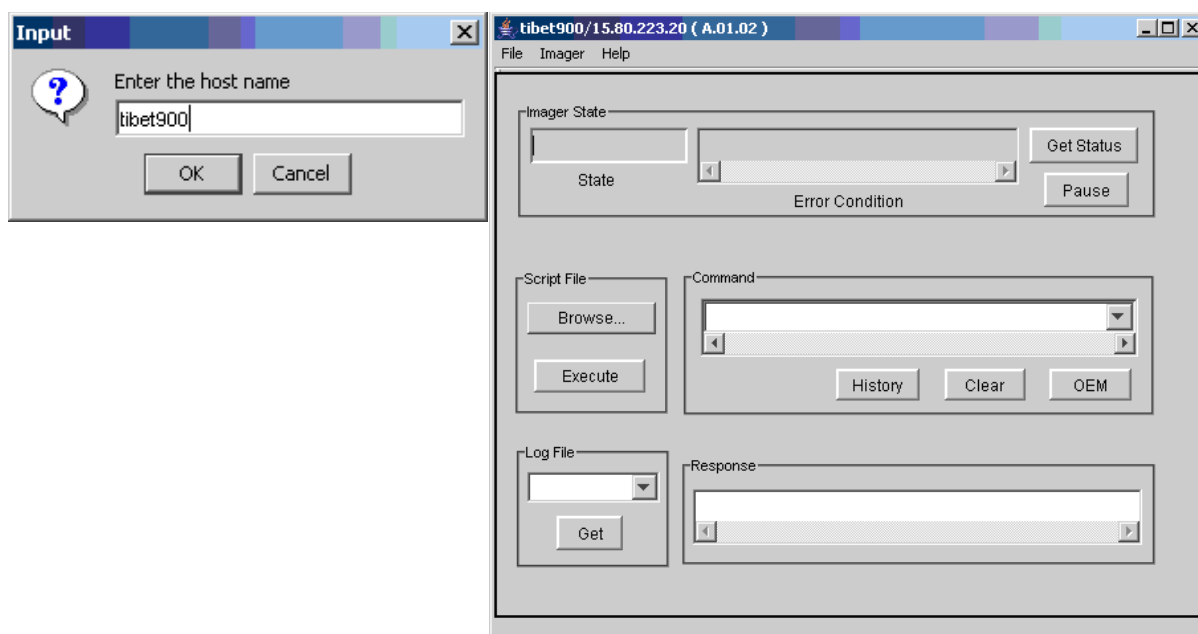
## Equipment

- PC/Laptop
- Crossover cable

No other equipment is required or connection to the other modules.

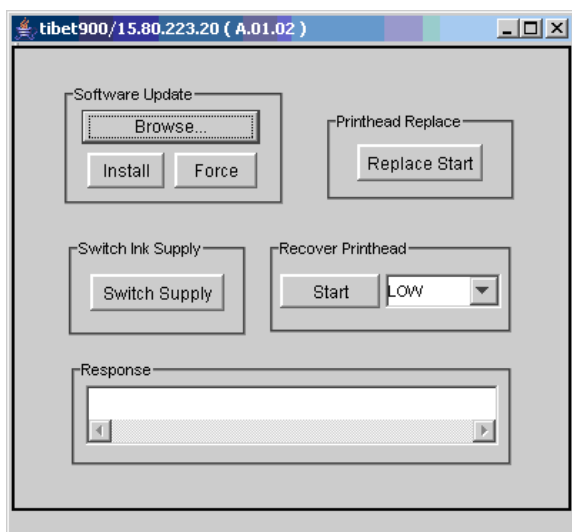
## Procedure

1. Download on a PC, the last firmware release from the SPS Secure Web.
2. Connect the power cord to controller, and crossover from the PC to the controller
3. Power-on the Imager Controller.
4. Open the Java application and connect to the Imager Controller. Type the default IP Address - 192.168.1.1 if the Imager Controller is new, or the name that is assigned on the network into the input window, and hit **OK**.

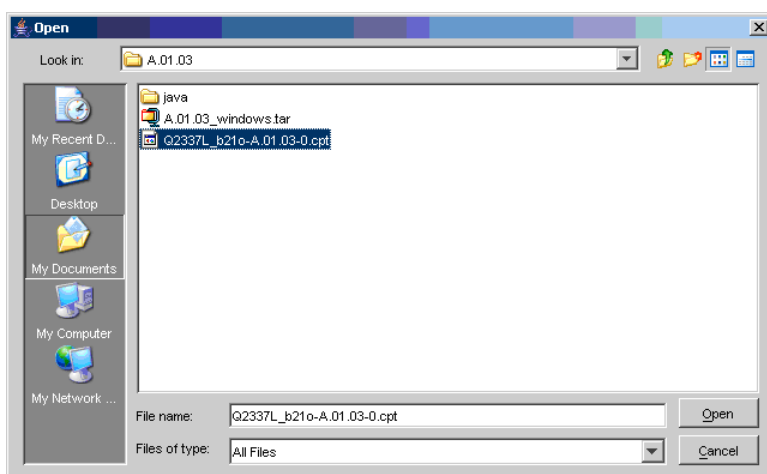


5. Click on the "Imager" drop down menu and click on Maintenance.

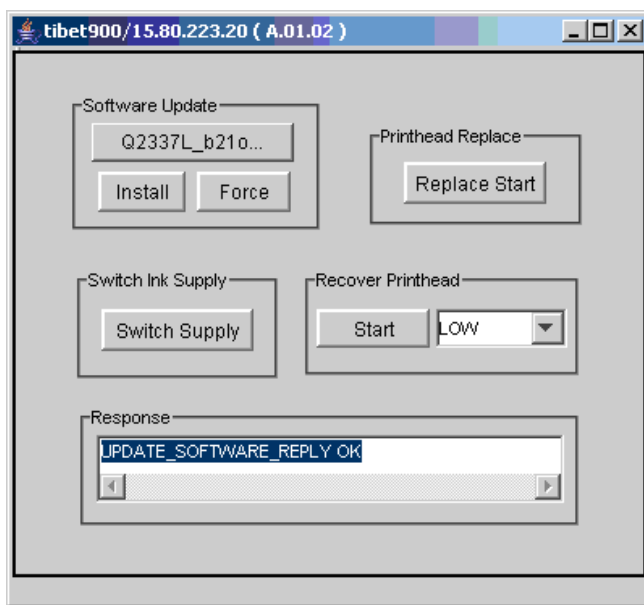




- a. Click on **Browse** button in the Software Update section.
- b. Go to the directory with the downloaded Encrypted Update Package and select the file, then hit **Open**

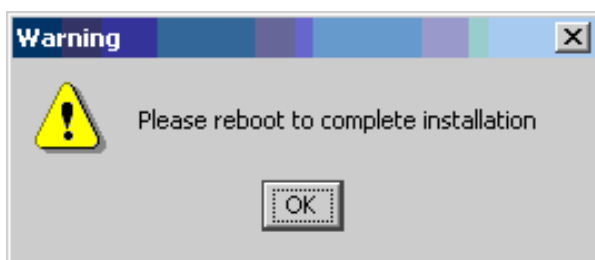


- c. When the update file is selected hit **Force** button.
- d. On the Response section of the window you should receive "UPDATE\_SOFTWARE\_REPLY OK" message.



The force button will install any version of code; do not use the install button.

6. When the installation is complete the following message will show up.



7. Reboot the Imager; this takes more time then normal. Also, the IP address may have to be changed to the OEM's preferred address.

---

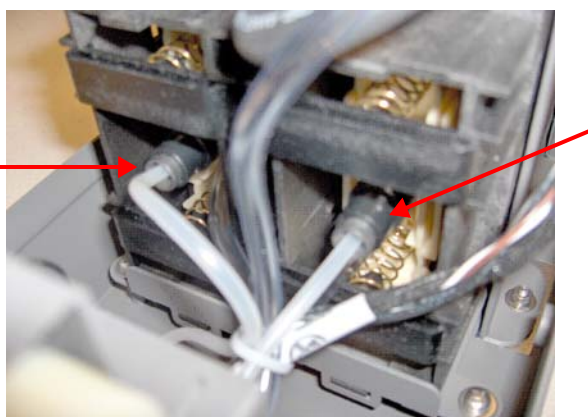
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# Appendix J: Ink Removal / Purging Procedure

## Before you begin

1. Remove IDS cover (see IDS replacement procedures)
2. Disconnect the Ink Tubes connection at the Ink Stall.



**Figure J-1** Ink tubes quick disconnects

## Procedure

### Illustration



### Description

Remove printhead from imaging head.

---

**Illustration**

---

**Description**

Insert syringe into the septum.



Remove ink from the ink system. Start pulling syringe back.



---

**Illustration**

---

**Description**

---

**IMPORTANT:** Once you start the syringe, hold into place while removing ink.

---



---

Dispose unwanted ink into hazardous waste container.

---

**IMPORTANT:** The OEM is responsible to inform the customer on proper ink disposal. This must include a warning to be careful when mixing different inks during disposal. Mixing of solvents can cause a reaction.

---

---

If required, you can reinstall ink tube into stalls and replace IDS cover at this time.

---

**IMPORTANT:** Although the system has been purged, it is not clean. You must not introduce a different ink into the system.

---

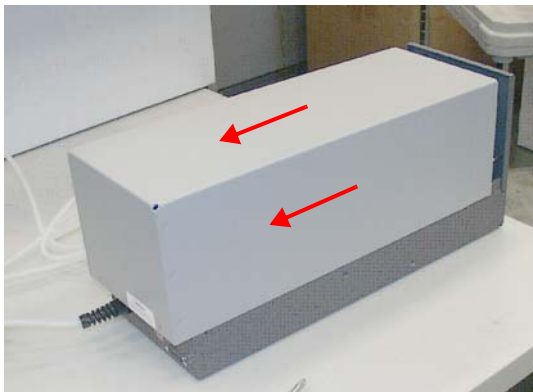
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**Illustration**

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**Description**

Remove two screws to release top case using a Phillips head screwdriver.



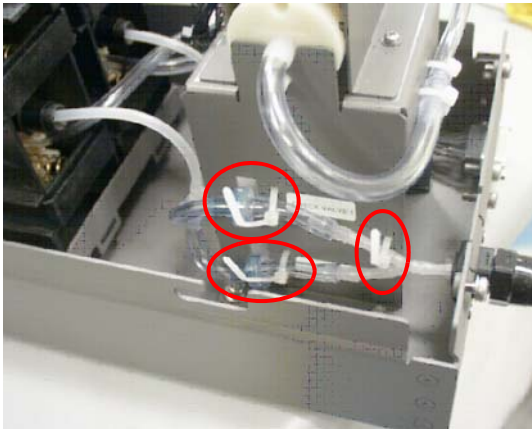
Slide top case towards the rear of the IDS and remove.



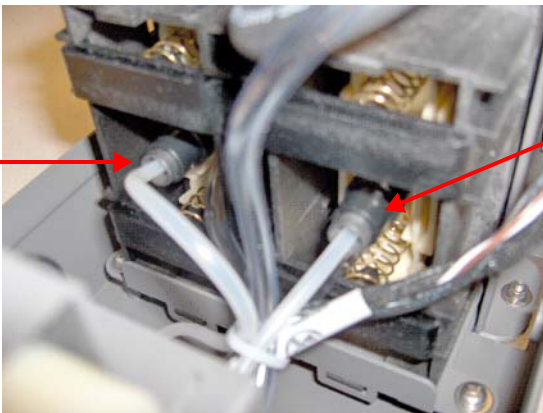
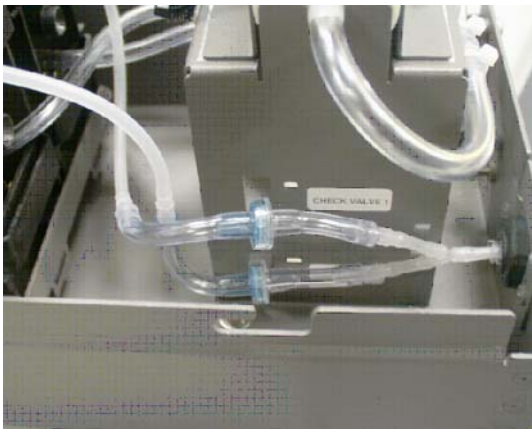
Remove the 2 screws retaining the Ink Tube bracket onto the chassis.

# Illustration

# Description



Remove tie wraps from tubing.



Push on quick disconnects to release tube from back of stalls.

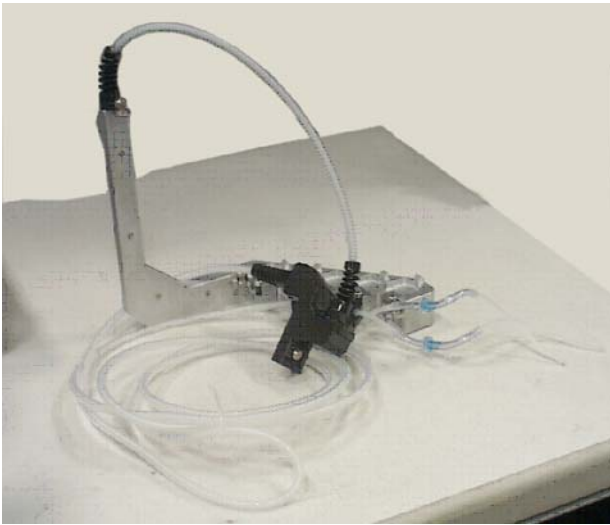




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**Illustration**

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**Description**

Crane and tubing removed from IDS.

---

---

# Appendix K: Returning Modules with Ink Contamination

---

## Goal

1. Minimization of ink leakage or ink seepage out of the module, thus avoiding contamination of packaging materials.
2. Prevent ink leaking/seeping onto the packaging box and getting on to personnel handling the package or handling equipment.

---

## Precaution



**CAUTION:** Use gloves, eye protection and lab coat while performing this task. Handle paper towels with tools to avoid getting ink on clothing.

---

---

## Procedure

Preparation process for anyone handling module with ink contamination, for return to SPS:

1. Wipe off excess ink on all outside surfaces; dispose of the dirty towels per your appropriate process.
2. Remove the top cover or enclosure for the unit. Wipe off any ink on the cover or enclosure.
3. If the module is the IDS, purge the ink line of all ink.
4. If there is an easy method to dispose of the leaked ink that is inside the module, pour out the ink into an approved ink disposal container, and dispose of the ink per your approved process.
5. Fill the available volume of space with paper towels. Let the towels absorb as much as possible, then remove the towels and dispose of them per the appropriate process.
6. Before packaging, fill the volume of space available in the module completely with towels, even in areas that there is no ink.
7. Reinstall the cover or enclosure.
8. Place the module in a plastic bag that completely encloses the module. If paper towels can be placed in the bag, place them with the module near any opening that ink may still seep out of.
9. Seal the plastic bag. If the module is an IDS, place the crane assembly in a bag and seal it.
10. Package the module in its shipping container and return the unit to SPS.
11. Assure that the packaging documentation includes the type of ink, ink name or part number.

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